



Mr. Kevin Bilash  
USEPA Region III  
Land, Chemicals & Redevelopment Division 3LD20  
1650 Arch Street  
Philadelphia, PA 19103

February 28, 2023  
File No. 4862.11

Re: Marcus Hook Terminal  
Monthly Progress Report – February 2023  
Area of Interest 7  
Marcus Hook, PA

Dear Mr. Bilash:

This monthly progress report is being submitted on behalf of Evergreen Resource Management Operations (Evergreen) for Area of Interest (AOI) 7 at the Marcus Hook facility. Note that on March 1, 2022, Sunoco Partners Marketing & Terminals L.P. changed its name to Energy Transfer Marketing & Terminals L.P. (Energy Transfer) and the facility changed its name from Marcus Hook Industrial Complex (MHIC) to Marcus Hook Terminal (MHT). On December 9, 2021, a Revised Interim Measures (IM) Workplan was submitted to the United States Environmental Protection Agency (USEPA) to address arsenic in the subsurface at AOI 7. The IM Workplan was approved by the USEPA on February 15, 2022. The discussion below provides an update on IM pre-design investigation (PDI) activities and Bench Scale Treatability Study activities.

**Activities completed this reporting period**

The activities completed for this reporting period (February 2023) included field mobilization for the sediment and porewater sampling activities that are planned for February 27, 2023 through March 3, 2023.

**Activities planned for the next reporting period**

The activities planned for the next reporting period (March 2023) include completion of the sediment and porewater sampling. Evergreen will provide USEPA with the results of the sediment and porewater results in a future submittal of the IM Monthly Progress Report after laboratory analysis and data validation have been completed.

**Deviation from approved activities this reporting period**

There were no deviations from the approved activities for this reporting period.

**Deviation from approved schedule**

There were no schedule deviations during this period. The schedule for the major milestones is provided below and the detailed schedule is included in Attachment A.



Task	Schedule
PDI Activities	3/2022 – 5/2022
Bench Scale Treatability Testing	5/2022 – 12/2022
Supplemental Sediment and Porewater Sampling	2/27/2023 – 3/3/2023
Pilot Testing	On pause
IM Performance Monitoring	On pause

The January 2023 progress report noted that the Bench Scale Treatability Report would be provided as an attachment to this next monthly report to discuss the results from the Bench Scale Treatability Study. As outlined in the Revised IM Workplan, Sanborn Head has prepared the Bench Scale Treatability Study Report, which is provided as Attachment B to this monthly progress report.

Very truly yours,  
SANBORN, HEAD & ASSOCIATES, INC.



Colleen Costello, P.G.  
Senior Vice President



Chelsey Shepsko, Ph.D., P.E.  
Senior Project Engineer

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#### **Attachments**

Attachment A – Interim Measures Implementation Schedule

Attachment B – Bench Scale Treatability Study Report

P:\4800s\4862.04\Source Files\Monthly Reports\Reports\February\_2023\20230228\_AOI 7 Monthly USEPA Report.docx

# Attachment A

## Interim Measure Implementation Schedule

### Evergreen

### Marcus Hook, Pennsylvania

Task Name	Start	Finish	Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3		
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Submit IM Workplan to EPA	12/09/21	12/09/21			<div><div></div></div>																					
EPA Approval of IM Workplan	12/10/21	02/15/22			<div><div></div></div>																					
<div>Monthly Report to EPA</div>	01/31/22	08/31/23																								
January 2022 Monthly Report	01/31/22	01/31/22				<div><div></div></div>																				
February 2022 Monthly Report	02/28/22	02/28/22					<div><div></div></div>																			
March 2022 Monthly Report	03/31/22	03/31/22						<div><div></div></div>																		
April 2022 Monthly Report	04/29/22	04/29/22							<div><div></div></div>																	
May 2022 Monthly Report	05/31/22	05/31/22								<div><div></div></div>																
June 2022 Monthly Report	06/30/22	06/30/22									<div><div></div></div>															
July 2022 Monthly Report	07/29/22	07/29/22										<div><div></div></div>														
August 2022 Monthly Report	08/31/22	08/31/22											<div><div></div></div>													
September 2022 Monthly Report	09/30/22	09/30/22												<div><div></div></div>												
October 2022 Monthly Report	10/31/22	10/31/22													<div><div></div></div>											
November 2022 Monthly Report	11/30/22	11/30/22														<div><div></div></div>										
December 2022 Monthly Report	12/30/22	12/30/22															<div><div></div></div>									
January 2023 Monthly Report	01/31/23	01/31/23																<div><div></div></div>								
February 2023 Monthly Report	02/28/23	02/28/23																	<div><div></div></div>							
March 2023 Monthly Report	03/31/23	03/31/23																		<div><div></div></div>						
April 2023 Monthly Report	04/28/23	04/28/23																			<div><div></div></div>					
May 2023 Monthly Report	05/31/23	05/31/23																				<div><div></div></div>				
June 2023 Monthly Report	06/30/23	06/30/23																					<div><div></div></div>			
July 2023 Monthly Report	07/31/23	07/31/23																						<div><div></div></div>		
August 2023 Monthly Report	08/31/23	08/31/23																							<div><div></div></div>	
<div>PDI</div>	03/07/22	06/30/22																								
PDI Mobilization	03/22/22	05/31/22																								
<div>Sediment and Porewater Sampling</div>	03/22/22	05/31/22																								
Field Mobilization	03/22/22	03/22/22																								
Collection of sediment samples and grab porewater samples	03/22/22	03/25/22																								
Collection of DGT porewater samples	03/22/22	03/23/22																								
Laboratory Data Analysis	03/28/22	04/29/22																								
Data Validation	04/26/22	05/10/22																								
Data Evaluation	04/18/22	05/31/22																								
<div>GW Elevation and GW Flow Evaluation</div>	03/25/22	06/30/22																								
Installation of Transducers	04/08/22	04/08/22																								
Deployment of Groundwater Flow Meter	05/24/22	05/24/22																								
Install stilling well	03/25/22	03/25/22																								
Data Collection	04/08/22	05/27/22																								

Task Name	Start	Finish	Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3		
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Data Evaluation	05/27/22	06/30/22																								
<div><div></div>Monitoring Well Installations, Soil Borings and Soil Sampling</div>	03/07/22	06/30/22																								
Obtain Access to Honeywell Property	03/07/22	05/09/22																								
Delaware Well Permits	03/21/22	04/01/22																								
Utility Clearance	03/25/22	03/25/22																								
Soil Borings, Well Installations and Soil Sampling	04/04/22	05/13/22																								
Laboratory Data Analysis	04/11/22	05/27/22																								
Data Validation	05/27/22	06/10/22																								
Well Development	04/07/22	05/13/22																								
Well and Boring Survey	05/24/22	05/24/22																								
Data Evaluation	04/11/22	06/30/22																								
<div><div></div>Groundwater Sampling</div>	05/24/22	06/30/22																								
Groundwater Sampling	05/24/22	05/27/22																								
Laboratory Data Analysis	05/27/22	06/10/22																								
Data Validation	06/10/22	06/23/22																								
Data Evaluation	06/10/22	06/30/22																								
<div><div></div>Bench Scale Treatability Test</div>	05/31/22	11/30/22																								
Baseline Characterization	05/31/22	06/13/22																								
Titration Test	06/10/22	06/13/22																								
<div><div></div>Reagent Screening</div>	06/14/22	08/26/22																								
Test Setup	06/14/22	06/14/22																								
Initial Test	06/17/22	08/08/22																								
Modification Test (If Needed)	06/30/22	08/08/22																								
Evaluation	07/11/22	08/26/22																								
<div><div></div>Rebound Test</div>	09/12/22	10/31/22																								
Reactor Setup	09/12/22	09/12/22																								
First Sampling and Replenishing	09/19/22	09/19/22																								
Second Sampling and Replenishing	09/26/22	09/26/22																								
Final Sampling	10/05/22	10/05/22																								
Evaluation	10/12/22	10/31/22																								
Bench-scale Study Report	11/01/22	11/30/22																								
<div><div></div>Additional Porewater Sampling</div>	02/27/23	04/28/23																								
Field Mobilization	02/27/23	02/27/23																								
Collection of porewater samples	02/27/23	03/03/23																								
Laboratory Data Analysis	03/06/23	03/27/23																								
Data Validation	03/27/23	04/03/23																								
Data Evaluation	03/27/23	04/28/23																								
<div><div></div>Pilot Test</div>	On pause																									
Pilot Study Design	<div></div>																									
<div><div></div>Pilot Study Implementation</div>																										
Permit																										
Injection Preparation																										
Injection Activities																										



[illegible]

## **Attachment B**

### **Bench Scale Treatability Study Report**

## Bench Scale Treatability Study Report

AOI 7, MARCUS HOOK TERMINAL

Marcus Hook, PA

Prepared for Evergreen Resources Management Operations

File No. 4862.05

February 28, 2023

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## 1.0 INTRODUCTION

The bench scale treatability study scope of work was included in Appendix K of the December 9, 2021 Revised Interim Measures Workplan (IM Workplan) for Area of Interest (AOI) 7 (AOI 7). The bench scale treatability study Workplan is also enclosed as **Appendix A** of this report. The objective of the bench scale treatability study was to evaluate in-situ remediation technologies for arsenic in AOI 7 groundwater, more specifically (i) identify the feasibility of in-situ remediation, (ii) select the optimal in-situ remediation technology, and (iii) determine the design parameters including reagent dosage and demand of an in-situ remediation technology. The bench scale treatability study investigated five reagents to achieve in-situ precipitation/sorption of arsenic: calcium sulfide (CaSx), hydrated lime (calcium hydroxide, Ca(OH)<sub>2</sub>), iron sulfide (FeSx), ion exchange (IX) resin, and sodium hydroxide (NaOH)<sub>2</sub>. Before the initiation of the bench scale treatability study, a pre-design investigation (PDI) including soil groundwater, sediment, and porewater data collection was completed to assist in the remedial design for AOI 7 in accordance with the IM Workplan. The results of the PDI sampling were submitted to the USEPA in the June 30, 2022 and July 29, 2022 monthly progress reports. The PDI soil and groundwater sampling methodology and results are only summarized in this report in the context of the bench scale treatability testing. Any mention of PDI activities throughout this report is in relation to the PDI activities to complete the bench scale treatability testing. Other PDI-related activities that were outlined in the IM Workplan will be discussed in a future submittal of the Corrective Measures Study (CMS). The CMS will present the analysis of the PDI activities and the bench scale treatability study in relation to the proposed final remedy for AOI 7.

The bench scale treatability study was completed in two phases: an initial reagent screening test followed by a rebound test. The initial reagent screening test selected the reagent that showed the most efficient treatment results. The selected reagent was then further tested during the rebound test to determine the potential long-term effectiveness of the treatment. The following is a discussion of the bench scale treatability study data collection, methodology, and results.

## 2.0 PRE-DESIGN INVESTIGATION METHODOLOGY

A pre-design investigation (PDI) in relation to the bench scale treatability study activities was conducted before the bench scale treatability study to achieve the following objectives:

- Installation of two new groundwater wells (MW-559D and MW-560D) along the AOI 7 boundary with SWMU 9 to determine arsenic concentrations in deep groundwater along this boundary.
- Installation of two new deep groundwater wells (MW-608D and MW-609D) along the Delaware River downgradient of the highest arsenic concentrations in groundwater and to assist in monitoring the effectiveness of arsenic remediation.
- Collection of soil and groundwater data to use in the bench scale treatability testing.

Details for each of the sample locations and methodology are summarized on **Table 1A**. Five borings and four monitoring well installations were completed at the locations shown on **Figure 1**. Ninety-six soil samples for arsenic, iron, biological oxygen demand (BOD), chemical oxygen

demand (COD), total organic carbon (TOC), grain size analysis, and Atterberg limits and 81 groundwater samples for dissolved arsenic, dissolved iron, dissolved manganese, phosphate, sulfate, and sulfide were collected as part of the PDI. In addition, bulk soil and groundwater samples were collected during the PDI for use in the bench scale treatability testing. The collection methodology as well as the results of the sampling from these activities is presented in more detail in the following sections.

## **2.1 Pre-Design Investigation**

The soil and groundwater sampling locations that were part of the PDI and bench scale bulk sampling collection are depicted in **Figure 1**. **Table 1A** provides the sampling location, sample analysis, analytical method, and target sample depth for each of these locations. **Table 1B** provides the locations for the samples that were used for the reagent screening tests and rebound test. The soil boring logs are included in **Appendix B**.

### **2.1.1 Soil Boring and Monitoring Well Installation and Soil Sampling**

Sanborn Head utilized existing utility maps and retained Ground Penetrating Radar Systems, Inc. (GPRS) to clear utilities using Ground Penetrating Radar and Radio Frequency Detection at each boring and monitoring location shown on **Figure 1**. Sanborn Head also worked with the drilling contractor (Parratt Wolff, Inc.) to support their completion of the PA One Call 811 three days prior to advancing the borings.

Following utility clearance, Sanborn Head oversaw the drilling contractor, Parratt Wolff, to install monitoring wells and borings. Soil borings were advanced by Parratt Wolff using a Geoprobe drill rig. Five soil borings were completed in total, three (MW-559D, MW-560D, AOI7-BH-22-001) were advanced to 30 feet (ft) below grade surface (bgs) and two soil borings (MW-608D and MW-609D) were advanced to 40 ft bgs, as detailed in **Table 2**. AOI7-BH-22-001, MW-608D, and MW-609D were completed from April 5, 2022 to April 6, 2022. MW-559D and MW-560D were completed on May 11, 2022. MW-559D and MW-560D were completed later than the other three soil borings due to the access required on the adjacent property to AOI 7 to complete these soil borings safely. The locations of these five borings were selected based on the following objectives:

- MW-559D – arsenic delineation in the deeper soil and groundwater units at MW-559.
- MW-560D – arsenic delineation in the deeper soil and groundwater units at MW-560 and collection of bulk bench scale treatability soil and groundwater samples to assist in the evaluation of the potential influence from upgradient groundwater conditions collocated with a high arsenic concentration in soil on treatment effectiveness.
- MW-608D – arsenic delineation in the deeper soil and groundwater units downgradient of MW-606S/D and collection of bulk bench scale treatability soil and groundwater samples to assist in the evaluation of potential influence from upgradient groundwater conditions collocated with a high arsenic concentration in soil on treatment effectiveness.
- MW-609D – arsenic delineation in the deeper soil and groundwater units downgradient of MW-532U/L and collection of bulk bench scale treatability soil and groundwater samples to identify the treatment technology that can best reduce high arsenic concentrations in site groundwater.

- AOI7-BH-22-001 – collection of bulk bench scale treatability soil samples in the MW-534U/L area to represent an area of relatively high arsenic concentrations in groundwater with different geochemical conditions than the southwestern corner of AOI 7.

### **2.1.2 Soil Sampling**

At the request of the EPA in their June 23, 2021 and October 26, 2021 correspondences, soil samples were collected for arsenic and iron analyses every 5 ft, in the center of each sampling interval, during completion of the five PDI borings and four monitoring well installations from April 4, 2022 to April 6, 2022 and on May 11, 2022. Additional samples for COD, BOD, TOC, grain size analyses, and Atterberg limits were collected at select locations to inform the bench scale treatability design as noted in **Table 1A**. Soil samples to establish the baseline concentrations for these parameters was completed at all five locations to determine whether the permanganate soil oxidation test (SOD) was to be conducted and to provide the basis for initial dosage ranges for select reagents that will be discussed in following sections of this report. The analytical samples were submitted to SGS North America, Inc. (SGS) of Dayton, New Jersey under the standard chain of custody. In accordance with the IM Workplan, arsenic and iron analyses were completed via EPA method 6010D, COD via EPA method 5220, BOD via EPA method 5210, and TOC via Lloyd Kahn method. Samples were analyzed for each homogenized soil sample at the SGS laboratory. Grain size analysis was analyzed for select samples collected from AOI7-BH-22-001, MW-560D, and MW-609D and Atterberg Limits were analyzed for select samples collected from MW-608D and MW-609D (**Table 1 A**). Data validation of the arsenic and iron soil samples collected was completed by Environmental Standards. The laboratory and data validation reports are provided in **Appendix C**.

Bulk soil collection for the bench scale treatability study occurred at the following soil boring locations: MW-560D, MW-608D, MW-609D, and AOI7-BH-22-001 (**Figure 1**). The following bulk soil samples were collected:

- MW-560D – one sample of approximately 5.7 kg of soil was collected 15 to 25 ft bgs to assess the potential influence from upgradient groundwater conditions collocated with a high arsenic concentration in soil.
- MW-608D – one sample of approximately 5.7 kg of soil was collected 10 to 25 ft bgs and one sample of approximately 5.7 kg of soil was collected 25 to 33 ft bgs due to the elevated arsenic concentration in groundwater at this location and to assess the potential influence from upgradient groundwater conditions collocated with a high arsenic.
- MW-609D - one sample of approximately 5.7 kg of soil was collected 18 to 25 ft bgs since it was installed adjacent to MW-532L which had the highest arsenic concentrated in groundwater detected within AOI 7.
- AOI7-BH-22-001 - one sample of approximately 5.7 kg of soil was collected 20 to 28 ft bgs since it was installed adjacent to MW-534L, which represented elevated arsenic concentrations but with different geochemical conditions in groundwater due to the presence of light non-aqueous liquid (LNAPL) in MW-543L, to be able to evaluate LNAPL impact on treatment effectiveness during the bench scale treatability testing.



All bulk soil samples for the bench scale treatability testing were stored in plastic containers without headspace and sealed tight with Teflon tape. The soil sample containers were stored on ice and delivered to the bench scale treatability study facility (Terra Systems, Inc. in Claymont, Delaware).

### **2.1.3 Monitoring Well Installation**

Four deep wells (MW-608D, MW-609D, MW-559D and MW-560D) were installed at the locations shown on **Figure 1**. MW-559D and MW-560D were paired with existing shallow wells MW-559 and MW-560 and installed on May 11, 2022. MW-608D and MW-609D were installed on April 5, 2022 and April 6, 2022, respectively. Monitoring wells MW-559D and MW-560D were advanced down to 30 ft bgs and MW-608D and MW-609D were advanced down to 40 ft bgs to be consistent with existing AOI 7 deep well screened elevations. The screen intervals for MW-559D and MW-560D were set at 20 to 30 ft bgs and the screen intervals for MW-608D and MW-609D were set at 28 to 40 ft bgs. The four wells were developed by Parratt Wolff, and all purge water was containerized and taken off-site for disposal. The four monitoring wells and soil boring AOI7-BH-22-001 were surveyed on May 24, 2022 by Vargo Associates. Soil boring and well construction information for the newly installed wells and soil boring is provided in **Table 2**.

### **2.1.4 Groundwater Sampling**

After the stabilization period, the newly installed monitoring wells in AOI 7 were sampled on May 24, 2023 through May 26, 2022 to establish baseline conditions and to collect samples to use in the bench scale treatability study. Prior to sample collection, the occurrence of LNAPL in these monitoring wells were determined using an oil-water interface probe and static water levels were measured at all monitoring wells to inform groundwater elevation. LNAPL was detected in 14 wells across the Site, consistent with previous investigations. None of the four new monitoring wells contained LNAPL. A groundwater sample was collected even if LNAPL was detected in the monitoring well, following modified procedures to ensure LNAPL was not present in the groundwater sample as described below. Groundwater elevations were modified based on the measured thickness of the detected LNAPL, as appropriate. The groundwater elevations will be detailed in the future submittal of the CMS.

In accordance with the IM Workplan, two sampling methods were used to collect groundwater samples from the wells at AOI 7. Wells that did not have LNAPL present were sampled using USEPA low-flow sampling methods which included the collection of stabilized geochemical parameters including pH, specific conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) using a water quality meter. Samples that had LNAPL present were sampled using the following procedure:

- The bottom of a larger inner diameter tubing (3/4") was capped and placed in the middle of the well screen. The tubing was left in the well for 24 hours to allow LNAPL present in the water column to stabilize after the tubing insertion.
- After 24 hours, a smaller inner diameter tubing (3/8") was inserted through the larger diameter tubing and pierced through the cap at the bottom of the larger tubing.

- Using a peristaltic pump, groundwater was purged from the well for approximately 5 minutes and then sampled. Drawdown was monitored to be cautious of the LNAPL-water interface and the sample was inspected to verify that LNAPL was not present in the sample container.

For both sampling methods, dissolved arsenic and dissolved iron samples were collected through 45 micron in-line field filters. Low-flow sampling sheets are included in **Appendix D**. In addition to low-flow sampling, passive diffusive bags (PDBs) from EON Products, Inc. were deployed on May 26, 2022 to collect dissolved arsenic, sulfate, and sulfide concentrations at two different depths in the screened intervals of MW-608D and MW-609D. MW-608D PDBs were installed at depths of 32 ft bgs and 38 ft bgs. MW-609D PDBs were installed at depths of 33 ft bgs and 39 ft bgs. On June 9, 2022, the PDB samplers that were placed into MW-608D and MW-609D were retrieved for dissolved arsenic, sulfate, and sulfide analysis.

All groundwater samples were submitted to SGS for analysis. The following analytical methodology was used for each analyte:

- Dissolved arsenic, dissolved iron, and dissolved manganese were analyzed via EPA Method 6010D.
- Sulfate was analyzed via EPA method 9056A.
- Sulfide was analyzed via EPA method 376.2.
- Phosphate (ortho) was analyzed via EPA method 365.3.

Data validation was conducted for the total and dissolved arsenic/iron groundwater samples collected during this event by Environmental Standards, Inc. Laboratory and data validation reports are included in **Appendix C**.

Groundwater for the bench scale treatability test was collected from nine wells between May 23, 2022 and May 26, 2022. Five wells (MW-560D, MW-606S, MW-608D, MW-609D, and MW-56D) with elevated arsenic levels (concentrations above at least one order of magnitude above the groundwater PRG) were selected for both the screening and rebound tests, and four wells (MW-560, MW-509, MW-509D, and MW-533L) with comparatively low arsenic concentrations (less than one order of magnitude above the groundwater PRG) were selected for the rebound test, as detailed in **Table 1B**. The wells selected for the rebound test were selected because they showed similar geochemical conditions to the corresponding wells with historic elevated arsenic concentrations and are located upgradient of the treatment wells. Note that MW-56D was collected as a surrogate sample for the MW-534L location due to LNAPL present in the entire column width of MW-534L. Five liters of groundwater were collected from MW-560D, MW-606S, MW-608D, MW-609D, and MW-56D and two liters of groundwater were collected from MW-560, MW-509, MW-509D, and MW-533L. All groundwater samples were stored in 10-liter, air-tight sampling containers. The containers were able to avoid any headspace by collapsing the container until all air bubbles were removed and only liquid was able to come out from the container at the top.

MW-560D and MW-606S were resampled on June 28, 2022 because the groundwater results from the initial sampling at the treatability laboratory (before any treatment) of the

groundwater from these wells to be used in the treatability testing had significantly lower arsenic concentrations than those observed from the PDI sampling, which may have been due to inadvertent oxygen being introduced into the 10 liter sampling container for these wells after arrival at the treatment facility. Therefore, the new bulk samples from MW-560D and MW-606S to be used in the bench scale treatability testing were collected under a constant nitrogen blanket to avoid any oxygen infiltration into the groundwater sample container. During the resampling process, the bulk samples were collected in ten 1-liter amber bottles and three samples were collected at the beginning, middle, and end of the bulk sampling for laboratory analyses to determine if oxidation can occur during the collection process.

### 3.0 PRE-DESIGN INVESTIGATION RESULTS

Section 3.0 presents the results of the 2022 PDI activities that were completed in relation to the IM Workplan. **Table 3** presents the analytical soil data collected as part of the 2022 PDI field activities. **Table 4A** presents groundwater analytical results and **Table 4B** presents the groundwater geochemistry from the applicable field parameters. **Appendix C** includes laboratory and data validation reports for analyses on the PDI soil and groundwater results collected in 2022.

#### 3.1 Soil Analytical Summary

PDI soil samples were collected and analyzed for arsenic (35 samples), iron (35 samples), BOD (15 samples), COD (15 samples), TOC (15 samples), grain size analysis (9 samples), and Atterberg limits (2 samples). **Table 3** shows the analytical results of these analyses and the locations they were collected from out of the five soil borings collected in 2022.

##### 3.1.1. Metals

###### Arsenic

A total of 35 soil samples for arsenic analyses were collected during the 2022 PDI activities. The results of the arsenic soil data are summarized on **Table 3**. The arsenic soil concentrations for each soil interval samples for MW-560D and MW-608D are also presented on the cross sections (**Figures 2A through 2C**).

The highest arsenic concentrations identified by the PDI activities were located in the southwestern area of AOI 7 consistent with previous findings. Arsenic soil concentrations from the five PDI borings ranged from non-detect to 14,800 milligram per kilogram (mg/kg). The highest arsenic soil concentrations from the PDI soil sampling were found at depths between 24 and 35 ft bgs in a very limited portion of AOI 7 (southwest corner), as shown in **Figure 2C**. Elevated arsenic soil concentrations were only found at shallow depths near the western side of Middle Creek adjacent to SWMU 9 (MW-559D soil concentration was 9,890 mg/kg in the 10 to 15 ft bgs interval and MW-560D soil concentration was 6,940 mg/kg in the 10 to 15 ft bgs interval).

###### Iron

A total of 35 soil samples for iron analyses were collected during the 2022 PDI activities. The results of the iron soil data are summarized on **Table 3**. Iron concentrations from the PDI results in soil ranged from 12,400 mg/kg to 192,000 mg/kg. The PDI soil iron results are consistent with

previous investigations, such that the iron soil concentrations in the southwestern corner of AOI 7 are lower when compared with iron soil data found in the northern portion of AOI 7 at depths of 5 to 15 ft bgs.

### **3.1.2 BOD, COD, TOC**

A total of 15 soil samples were collected for BOD, COD, and TOC during the 2022 PDI activities. **Table 3** presents the analytical results for BOD, COD, and TOC from locations MW-559D, MW-560D, MW-608D, MW-609D, and AOI7-BH-22-001 and are summarized below.

- BOD in soil concentrations ranged from 97.6 mg/kg at MW-559D to 9,650 mg/kg at AOI7-BH-22-001.
- COD in soil concentrations ranged from 134 mg/kg at MW-559D to 210,000 mg/kg at AOI7-BH-22-001.
- TOC in soil concentrations ranged from 595 mg/kg at MW-559 D to 126,000 mg/kg at MW-609D.

In general, BOD, COD, and TOC are highly correlated (i.e., BOD showed higher concentrations at locations where COD and TOC also showed higher concentrations). This correlation suggests that the major contribution to oxygen demand (BOD and COD) was due to high organic content. The high BOD and COD levels confirmed that subsurface conditions cannot be readily converted from reductive to oxidative conditions. Therefore, the oxidation test by potassium permanganate proposed for consideration in the IM Workplan was not completed as part of the bench scale treatability study because use of an oxidation technology for in-situ remediation of arsenic in groundwater would be very difficult to accomplish due to the elevated oxygen demand in the subsurface.

### **3.1.3 Geotechnical Parameters**

Nine samples were collected for grain size analysis during the PDI activities at locations AOI7-BH-22-001, MW-560D, and MW-609D based on 3 soil lithologies encountered at each location: fill, silty clay, and silty sand. **Table 3** presents the results for grain size analysis at these locations. The grain size analysis confirmed that the soil depth interval which correlates with the highest observed arsenic concentrations in groundwater (25 to 30 ft bgs) had the highest percentages of fines ranging from 76.8% to 86.6% . Two samples were collected for Atterberg limits from locations MW-608D and MW-609D. The samples were taken from approximately 25 to 30 ft bgs, where elevated soil arsenic concentrations were detected. Based on the Atterberg limit results (provided in **Table 3**), the soil samples from the two locations can be classified as silt or clay soil with plasticity and high organic content. This classification indicates high soil cohesiveness, resulting in very low permeability for the areas of highest arsenic in soil.

## **3.2 Groundwater Analytical Summary**

A total of 13 monitoring wells (MW-56D, MW-509, MW-509D, MW-531L, MW-532L, MW-533L, MW-559D, MW-560D, MW-606S, MW-606D, MW-607D, MW-608D, MW-609D) were sampled during the 2022 PDI activities. A total of 81 groundwater samples were collected during the following sampling events as presented in **Table 4A**.

- May 24, 2022 to May 26, 2022: Low-flow groundwater sampling and analysis occurred at monitoring wells MW-56D, MW-531L, MW-532L, MW-559D, MW-560D, MW-606S, MW-606D, MW-607D, MW-608D, and MW-609D between May 24, 2022 and May 26, 2022 for bench scale treatability test screening. Bench scale bulk groundwater collection occurred at monitoring wells MW-56D, MW-509, MW-509D, MW-531L, MW-532L, MW-533L, MW-559D, MW-560D, MW-606S, MW-606D, MW-607D, MW-608D, and MW-609D during this event as well.
- June 3, 2022: Bench scale bulk groundwater samples from MW-56D, MW-560D, MW-606S, MW-608D, and MW-609D were analyzed on June 3, 2022 prior to the start of the bench scale treatability study to confirm arsenic concentrations from the May 24, 2022 to May 26, 2022 groundwater sampling event.
- June 9, 2022: Groundwater samples from MW-608D and MW-609D were collected from PDBs on June 9, 2022 to analyze dissolved arsenic, sulfate, and sulfide concentrations at the top (designated as MW-608D (A) and MW-609D (A) in **Table 4**) and bottom (designated as MW-608D (B) and MW-609D (B) in **Table 4**) of the well screens.
- June 28, 2022: Bench scale bulk groundwater samples from MW-560D and MW-606S were re-collected on June 28, 2022 under nitrogen blank to avoid oxidation. Groundwater samples were also collected and analyzed for dissolved arsenic at the beginning, middle, and end of the bulk sample collection. **Table 4** designates these groundwater samples as MW-560D (A) for the beginning sample, MW-560D (B) for the middle sample, and MW-560D (C) for the end sample. The same designation was used for the MW-606S samples collected on June 28, 2022.

### 3.2.1 Arsenic

The results of the arsenic groundwater data are summarized on **Table 4A**. **Figure 3** presents the distribution of arsenic in groundwater data from the groundwater sampling events from May 24, 2022 through May 26, 2022 event.

In the May 24, 2022 to May 26, 2022 event, 10 wells (MW-56D, MW-531L, MW-532L, MW-559D, MW-560D, MW-606S, MW-606D, MW-607D, MW-608D, and MW-609D) were sampled for dissolved arsenic. Dissolved arsenic concentrations ranged from 297 ug/L at MW-559D to 1,430,000 ug/L at MW-532L during the PDI sampling. The highest dissolved arsenic concentrations in groundwater in AOI 7 are located in the deeper aquifer at the southwestern corner of AOI 7 spanning (consistent with previous investigations).

The results from the two PDB samplers that were placed in MW-608D and MW-609D and collected on June 9, 2022 to evaluate the vertical concentration variation of dissolved arsenic are discussed below:

- MW-608D – the higher concentration of dissolved arsenic (207,000 ug/L) was observed at the deeper depth (38 ft bgs) as compared to the result of the sample from the shallower depth interval at 32 ft bgs (82,200 ug/L). The passive sampling results were less than 50% of the low-flow dissolved arsenic concentration collected from this well on May 24, 2022 at 494,000 ug/L.
- MW-609D – the dissolved arsenic results from the two sampled intervals (33 ft bgs and 39 ft bgs) showed similar concentrations (649,000 ug/L and 638,000 ug/L, respectively).



The passive sampling results were similar to the low-flow dissolved arsenic concentration collected from this well on May 24, 2022 at 633,000 ug/L.

On June 3, 2022, five samples from the bench scale treatability samples from MW-56D, MW-560D, MW-606S, MW-608D, and MW-609D were submitted to SGS for dissolved arsenic analysis via EPA method 6010D to evaluate whether dissolved arsenic concentrations in the bulk treatability groundwater storage bags were consistent with the dissolved arsenic concentration results from the low-flow groundwater sampling event that occurred on May 24, 2022 to May 26, 2022. The dissolved arsenic concentrations in the storage bags for MW-56D, MW-608D, and MW-609D were similar to the concentrations measured in the corresponding wells, whereas the dissolved arsenic concentrations in the storage bags of MW-606S and MW-560D were not consistent with the results from MW-606S and MW-560D. Therefore, the bulk groundwater samples were resampled from MW-606S and MW-560D on June 28, 2022. The analytical results from MW-606S showed similar dissolved concentrations between 6,210 ug/L and 6,810 ug/L while three samples from MW-560D showed a distinctive decreasing trend from 26,100 ug/L at the beginning to 15,700 ug/L at the end of sampling, indicating that the extent of the highly impacted arsenic groundwater plume is limited in extent and that less impacted groundwater was sampled by the end of the groundwater extraction process for the bulk treatability samples, which collects a larger volume of sample.

### **3.2.2 Geochemical Analytical Results**

The results of the analytical geochemical parameters (dissolved iron via EPA method 6010D, dissolved manganese via EPA method 6010D, phosphate via EPA method 365.3, sulfate via EPA method 300.0, and sulfide via EPA method 376.2) in groundwater data are summarized on **Table 4A**. The low-flow groundwater sampling results from the May 24, 2022 to May 26, 2022 event are presented below.

- **Dissolved iron** - Ten wells (MW-56D, MW-531L, MW-532L, MW-559D, MW-560D, MW-606S, MW-606D, MW-607D, MW-608D, and MW-609D) were sampled for dissolved iron. Dissolved iron concentrations ranged from 41,500 ug/L at MW-559D to 319,000 ug/L at MW-606D during the PDI sampling. Dissolved iron concentrations informed the dosage of the bench scale treatability test.
- **Sulfate** - Eight wells (MW-56D, MW-531L, MW-532L, MW-559D, MW-560D, MW-606S, MW-606D, and MW-607D) were sampled for sulfate. Sulfate concentrations ranged from non-detect at MW-56D and MW-531L to 8,860 milligrams per liter (mg/L) at MW-606D during the PDI sampling. Sulfate concentrations were highest in the southwestern corner of AOI 7. The sulfate concentrations helped inform the dosage of the bench scale treatability test to overcome sulfate competition for arsenic remediation.
- **Sulfide** - Seven wells (MW-56D, MW-531L, MW-532L, MW-559D, MW-560D, MW-606D, and MW-607D) were sampled for sulfide. Sulfide concentrations ranged from non-detect at MW-559D and MW-560D to 7.1 mg/L at MW-532L during the PDI sampling. The sulfide concentrations were highest at monitoring wells along the shoreline and in wells in the southwestern corner of AOI 7. The sulfide concentrations also helped inform the dosage of the bench scale treatability test.



On June 3, 2022, five samples from the bench scale treatability samples from MW-56D, MW-560D, MW-606S, MW-608D, and MW-609D were submitted to SGS for dissolved manganese, phosphate, and sulfate to evaluate the baseline concentrations in the bulk treatability groundwater storage bags to compare against the concentrations of these analytes post-remediation. The baseline results are discussed below.

- **Dissolved manganese** – Dissolved manganese concentrations ranged from 247 ug/L at MW-560D to 1,980 ug/L at MW-608D. The low concentrations of dissolved manganese show that manganese is not anticipated to be a competitor for reagents during the bench scale treatability test. Dissolved manganese concentrations helped inform the dosage of the bench scale treatability test and evaluating treatment effectiveness by comparing pre- and post-remediation concentrations.
- **Phosphate** – Phosphate concentrations ranged from non-detect at MW-560D and MW-606S to 3.6 mg/L at MW-608D. The low concentrations of phosphate show that phosphate is also not anticipated to be a competitor for reagents during the bench scale treatability test. Phosphate concentrations helped evaluate treatment effectiveness by comparing pre- and post-remediation concentrations.
- **Sulfate** – Sulfate concentrations ranged from non-detect at MW-56D and MW-531L to 2,560 mg/L at MW-606S. Sulfate concentrations were highest in wells in the southwestern corner of AOI 7 similar to the low-flow sampling results from May 24, 2022 to May 26, 2022. Sulfate concentrations helped to determine treatment effectiveness by comparing pre- and post-remediation concentrations.

Two PDB samplers were placed in MW-608D and MW-609D to evaluate the vertical concentration variation of sulfate and sulfide. The PDB sample results are discussed below.

- MW-608D – the higher concentration of dissolved sulfide (4.3 mg/L) was observed at the deeper depth (38 ft bgs) as compared to the result of the sample from the shallower depth interval at 32 ft bgs (2.4 mg/L). The sulfate results from the two sampled intervals (32 ft bgs and 38 ft bgs) showed similar concentrations (1,730 mg/L and 1,800 mg/L, respectively). The passive sampling results for sulfate were similar to the low-flow sulfate concentration collected from this well on May 24, 2022 at 2,100 mg/L.
- MW-609D – the sulfide results from the two sampled intervals (33 ft bgs and 39 ft bgs) showed similar concentrations (5.3 mg/L and 5.9 mg/L, respectively). The sulfate results from the two sampled intervals (33 ft bgs and 39 ft bgs) also showed similar concentrations (1,740 mg/L and 1,720 mg/L, respectively). The passive sampling results were similar to the low-flow sulfate concentration collected from this well on May 24, 2022 at 1,970 mg/L.

### **3.2.3 Field Parameters**

Eleven field measurements for pH and oxidation-reduction potential (ORP) collected during the May 24, 2022 to May 26, 2022 groundwater sampling event, as summarized on **Table 4B**. The results of the field parameters are outlined below.

- pH – Values ranged from 3.37 standard units (S.U.) at MW-560 to 7.00 S.U. at MW-532L.
- ORP – Values ranged from -212 millivolts (mV) at MW-532L to 453 mV at MW-560.

In general, the field parameter results were consistent with the results from previous groundwater sampling events. The general negative ORP values were observed in the wells impacted with high levels of dissolved arsenic. Only two wells showed positive ORP levels (MW-533L and MW-560). These locations have dissolved arsenic concentrations that are low compared to the other wells that were sampled. Except for MW-560D, the pH levels were neutral (ranging from 6.13 to 7.0 S.U.). The baseline ORP and pH values are important for determining the titrations and dosages of the select reagents that were used in the treatability study and discussed in the following section.

#### **4.0 BENCH SCALE TREATABILITY STUDY METHODOLOGY**

The bench scale treatability study was performed at Terra Systems, Inc. in Claymont, Delaware with Sanborn Head personnel. The bench scale treatability study was completed in two phases: an initial reagent screening test and a rebound test. The initial phase investigated five reagents, calcium polysulfide (CaSx), hydrated lime (calcium hydroxide, Ca(OH)<sub>2</sub>), iron sulfide (FeS), ion exchange (IX) resin, and sodium hydroxide (NaOH) for five different soil and groundwater pairs (**Table 5A**). Dissolved arsenic concentrations along with various geochemical parameters were analyzed during this test (**Table 5B**). Ca(OH)<sub>2</sub> was selected for further testing due to its effective treatment results, dosage demand, and applicability at the site. The rebound test determined the long-term effectiveness of the treatment using Ca(OH)<sub>2</sub>. The rebound test was set up (as shown in **Table 6**) to simulate if upgradient groundwater could remobilize any of the arsenic after the initial mass of arsenic was remediated. During the rebound test, both soil and groundwater samples were collected for all treatments, as specified in **Table 7**. The groundwater results for dissolved arsenic were compared to the groundwater PRG of 1,253 ug/l arsenic as the remedial action objective for the proposed IM groundwater remedy.

#### **4.1 Reagent Selection**

The bench scale treatability study assumed that one of the following technologies can be used for in-situ remediation of arsenic within AOI 7: sulfide precipitation, high pH precipitation, and direct sorption. The reagent specifications and safety data sheets (SDS) are enclosed in **Appendix E**. The following provides more detail on each of the reagents proposed for the bench scale treatability testing:

- CaSx: This reagent is the most widely used product to provide sulfide for various metal remediations and increase pH. Sulfide and higher pH levels are both beneficial for arsenic precipitation. The test dosages for the bench scale treatability study were determined by sulfide stoichiometric demand, which is determined by the reactive constituents including arsenic and iron in groundwater. The testing dosages in the bench scale treatability study were set to be one time (1X), two times (2X), and three times (3X) the stoichiometric demand, which was derived from dissolved arsenic and iron groundwater concentrations from the PDI. The lowest dosage should be higher than the titration results, as stated in Section 4.2 below. Remotox®, a 29% CaSx solution from Grause Chemicals was used for the study.
- Ca(OH)<sub>2</sub>: The application of Ca(OH)<sub>2</sub> can increase pH to form various calcium arsenate complexes. Also, if an elevated soluble iron level is present, the pH increase can form iron oxides and iron hydroxides, which can sorb arsenate or form iron arsenate. A



titration test using  $\text{Ca}(\text{OH})_2$  was used to determine its dosage to increase the pH of the groundwater. The  $\text{Ca}(\text{OH})_2$  dosages are the amounts to increase the groundwater and soil slurry to pH values of 8, 10, and 12 S.U.  $\text{Ca}(\text{OH})_2$  powder from Voluntary Purchasing Groups, Inc. was used for the study.

- FeS: FeS can sorb arsenic and enhance the precipitation of arsenic by forming arsenic sulfide. A commercially available product of iron sulfide is FerroBlack from Redox Solution Inc, in Carmel, IN. FerroBlack was applied according to the titration results and manufacturer's suggestion based on the initial arsenic concentrations in groundwater that were collected during the May 24, 2022 to May 26, 2022 groundwater sampling event. FeS will be referred to as FerroBlack throughout this report.
- IX: IX was considered for bench scale testing because of its high efficiency at sorbing arsenic. The dosage of IX was based on the stoichiometric demand of dissolved arsenic sorption to the IX resin. The test dosages in the bench scale treatability study were assumed to be one time (1X), two times (2X), and three times (3X) the stoichiometric demand. A commercial product FerriX™ A33E from Purolite was used for the bench scale treatability study. This product is a hybrid ion exchange resin with iron nanoparticles irreversibly imbedded into the resin and will be referred to as HIX-NanoFe throughout this report.
- Na(OH): The application of NaOH can increase pH to form arsenate complexes. This reagent was not specifically identified in the IM Workplan, however, based on the correlation between arsenic reduction and pH noted during the reagent screening test and that potassium permanganate had to be eliminated from the testing, NaOH was added to the bench scale treatability study in accordance with the IM Workplan's allowance to make modifications to the bench scale treatability study according to the results of the PDI activities and observations during the execution of the bench scale treatability study (see Section 2.5.3 of **Appendix A**). The NaOH dosages are based on the quantity of NaOH necessary to increase the groundwater to pH values of 8, 10, and 12 S.U. Laboratory grade NaOH from Sigma-Aldrich Inc was used for the study.

In addition to the reagents listed above, potassium permanganate was included in the IM Workplan for testing. As stated in Section 3.1, potassium permanganate was not tested due to high oxygen demand in site soils, which would react with the potassium permanganate rather than supporting the arsenic treatment.

#### **4.1 Step 1 - Sample Homogenization and Baseline Characterization**

The bulk soil and groundwater samples for the bench scale treatability study were homogenized separately for each sample location (**Table 1A**). The bulk soil sample from one of the five bench scale treatability study locations was placed in the chemical hood and homogenized using a soil mixer. The homogenized soil sample was repacked into the designated sample container without any headspace. This step was repeated for each bench scale treatability study location separately. The groundwater samples were homogenized by agitating the groundwater collection bags (which were stored without any headspace).

The groundwater samples were collected from each bulk container to analyze dissolved arsenic concentration on June 3, 2022 (**Table 4A**) as discussed in Section 3.2 above. Samples were

additionally analyzed for sulfide via Hach test kit and pH and ORP via the portable water quality meter at the TerraSystems facility after the groundwater samples arrived at the facility. The pH and ORP measurements from the bulk water samples were consistent with the field measurements. The dissolved arsenic concentrations in the bulk samples were comparable with the field concentrations collected from May 24, 2022 to May 26, 2022 for MW-56D, MW-608D, and MW-609D. However, the dissolved arsenic concentrations in bulk samples for MW-606S and MW-560D were lower than the field concentrations collected between May 24, 2022 and May 26, 2022. Therefore, the samples from MW-56D, MW-608D, and MW-609D were representative of the field conditions and the screening test proceeded for these three pairs. Additional bulk samples were collected for MW-560D and MW-606S as discussed in Sections 2.1.4 and 3.2.

#### **4.2 Step 2 - Titration Test and Dosage Estimate**

Titration tests were conducted to determine the  $\text{Ca}(\text{OH})_2$ , CaSx, and Ferroblack dosages. The titration record is summarized in **Appendix F**. Two types of slurries consisting of a low soil content with a soil:groundwater ratio at 1:3 and a high soil content with a soil:groundwater ratio at 1:1 were set up for each of the five sample pairs (named for the groundwater sample) for each of the titration tests. The five soil/groundwater pairs are designated as outlined below.

- MW-560D: Soil from MW-560D deep interval and groundwater from MW-560D.
- MW-606S: Soil from MW-608D shallow interval and groundwater from MW-606S.
- MW-56D: Soil from AOI17-BH-22-001 deep interval and groundwater from MW-56D.
- MW-608D: Soil from MW-608D deep interval and groundwater from MW-608D
- MW-609D: Soil from MW-609D deep interval and groundwater from MW-609D.

An alkaline titration test was completed by titrating the low soil content (1:3 ratio) and high soil content (1:1 ratio) slurries from each of the five sample pairs with  $\text{Ca}(\text{OH})_2$  powder to determine the  $\text{Ca}(\text{OH})_2$  reagent dosages required to increase the groundwater and soil slurry pH values to 8, 10, and 12 S.U. The CaSx solution was added to low soil content (1:3 ratio) and high soil content (1:1 ratio) slurries from each of the five sample pairs until the soil and groundwater slurry ORP levels decreased to below – 200 mV to elicit a reductive environment for arsenic removal. The FerroBlack solution was added to low soil content (1:3 ratio) and high soil content (1:1 ratio) slurries for the MW-56D and MW-609D sample pairs (which contained high dissolved arsenic concentrations) until the soil and groundwater slurry ORP levels decreased to below –100 mV as directed by the vendor. Note that Ferroblack titration was completed using only the MW-56D and MW-609D sample pairs because these samples have high dissolved arsenic concentrations in groundwater at different subsurface geochemical conditions and the titration results for these samples to achieve an ORP value of -100 mV would be applicable for all pairs (that contain lower dissolved arsenic concentrations in groundwater) because the lowest dosage should be higher than the titration results as recommended by the vendor.

The dosage estimate for all reagents during the reagent screening test in Step 3 is based on the titration test results and also considered the stoichiometric demand from groundwater geochemical parameters collected during the PDI as described in Section 3.2. Titration tests were conducted to determine the  $\text{Ca}(\text{OH})_2$ , CaSx, and FerroBlack testing dosages, as

summarized in **Appendix F**. For CaSx and HIX-NanoFe dosage estimates, the minimal stoichiometric demands should exceed the titration results (for CaSx) and the calculated sorption capacities (for HIX NanoFe), and the dosage estimates are summarized in **Appendix G**. As previously discussed, the Soil Oxidant Demand (SOD) for the potassium permanganate test was not completed due to the high levels of BOD, COD, and TOC in soil at the Site. A summary of the titration and dosage methodology is discussed below.

- CaSx dosages were based on the titration and stoichiometric demand from groundwater. As shown in **Appendix G**, the demand for CaSx is based on the sulfide reaction with dissolved arsenic, dissolved iron, and dissolved manganese in groundwater. The stoichiometric demands at one time (1X) were more than the titration results (to reach -200 mV).
- $\text{Ca}(\text{OH})_2$  dosages were targeted to reach pH values of 8, 10, and 12 S.U. based on titration results.
- FerroBlack dosages are assumed to be 4% and 7% weight by volume (w/v), provided by the vendor after the review of the titration results and initial arsenic concentrations in groundwater.
- HIX-NanoFe resin demand was based on the arsenic groundwater concentration and resin sorption capacity. The dosages varied among different soil and groundwater pairs. The highest HIX-NanoFe resin dosage was estimated for MW-608D because of high arsenic concentrations in its groundwater.

#### **4.3 Step 3 - Reagent Screening Test**

The purpose of the reagent screening test is to select the most appropriate reagent for each of the five soil and groundwater sample pairs. The screening test was completed according to the following schedule:

- In the week of June 14, 2022, the initial reagent screening test was completed for the three soil and groundwater pairs (MW-56D, MW-608D, and MW-609D) with high arsenic concentrations.
- Due to the lack of dissolved arsenic in the initial bulk samples, the groundwater samples were recollected for MW-606S and MW-560D on June 28, 2022.
- In the week of August 1, 2022, the reagent screening test was completed for the MW-560D and MW-606S pairs.

Between each step, analytical samples were collected to confirm the treatment efficiency or to confirm that the bulk bench scale treatability samples in storage were still representative of initial concentrations that were collected and analyzed during the May 24, 2022 to May 26, 2022 event. The turn-around time (TAT) ranged from two to three weeks, so the duration of the reagent screening test was approximately three months.

##### **4.3.1 Initial Test Setup and Sampling for High-Concentration Pairs**

For the first three sample pairs (MW-56D, MW-608D, and MW-609D), two different ratios of groundwater and soil were used to set up the screening test (**Table 5A**). The low soil content had a soil:groundwater ratio of 1:3 and the high soil content had a soil:groundwater ratio of

1:1. For the low soil content (1:3) reactors, 15 grams of soil samples were added to the reactor and then groundwater was filled to half volume of the 50-milliliter (ml) containers. Next, the reagent ( $\text{Ca}(\text{OH})_2$ , CaSx, FerroBlack, or HIX-NanoFe) was added with the groundwater and soil slurries in the reactor. Finally, additional groundwater was added to top off the reactor and eliminate headspace. Similarly, for the high soil content (1:1) reactors, 45 grams of the soil sample were added to the reactor and then groundwater was filled to half volume of the 50-ml containers. The appropriate reagent dose was added, and then additional groundwater was added until there was no headspace in the reactor. As discussed above, the reagent dosages were determined from the PDI activities and titration test. For each sample, a total of 26 reactors were set up (**Table 5A**) as discussed below. To avoid oxygen interference and air infiltration, all reactors were set up without headspace and wrapped tightly with parafilm.

- Control: four reactors containing two soil and groundwater ratios (1:3 and 1:1).
- CaSx: six reactors containing three dosages at two different soil and groundwater ratios (1:3 and 1:1) per dosage.
- $\text{Ca}(\text{OH})_2$ : six reactors containing three dosages at two soil and groundwater ratios (1:3 and 1:1) per dosage.
- FerroBlack: four reactors containing two dosages at two soil and groundwater ratios (1:3 and 1:1) per dosage.
- HIX-NanoFe: six reactors containing three dosages and two soil and groundwater ratios (1:3 and 1:1) per dosage.

As previously discussed, permanganate was not included as a reagent to any treatability study samples due to high BOD, COD, and TOC levels that would interfere with the oxidizing capacity of permanganate to oxidize and remove arsenic in the subsurface.

All reactors were mixed and turned several times daily for three days. Groundwater samples (the supernatants in the reactors) were analyzed for dissolved arsenic, dissolved iron, sulfide, sulfate, phosphate, pH, and ORP after 3 days. Dissolved arsenic and dissolved iron samples were sent to the SGS laboratory for analysis under EPA method 6010D. The remaining parameters (sulfide, sulfate, phosphate) were analyzed at the TerraSystems facility using Hach test kits following EPA methods mentioned in Section 2.0 and a portable water quality meter was used to measure pH and ORP. The groundwater samples were filtered using a 0.45  $\mu\text{m}$  syringe filter prior to submission to the SGS laboratory for dissolved arsenic and iron analysis. The available groundwater sample volume in each reactor was less than 40 ml and the analytical lab requires 250 ml for metal analysis. As a common practice for treatability studies with small volume reactors, the samples were diluted with laboratory grade deionized water and a dilution factor of 50 times. The arsenic results in **Table 5B** reflect the estimated arsenic concentrations after the dilution factor was applied to the laboratory results. The reagent screening results are summarized in **Table 5B** and arsenic reduction graphs are summarized in **Appendix H**.

#### **4.3.2 Test Setup and Sampling for Low Concentration Pairs**

The reagent screening test setup for the MW-560D and the MW-606S pairs is summarized in **Table 5A**. The setup and sampling procedures for MW-560D and MW-606S sample pairs were

similar to the initial screening test, as described in the previous section. The only modification for this screening test was to replace CaSx with NaOH because:

- CaSx showed poor arsenic removal efficiencies, as discussed in Section 4.3.3 below.
- NaOH was added as a reagent because the initial screening test for the three sample pairs showed favorable results from  $\text{Ca}(\text{OH})_2$  treatment when the elevated pH was achieved, as discussed in Section 4.3.3 below. Because NaOH can also increase the pH of the slurry, NaOH was used for these two sample pairs. NaOH was amended to reach pH levels of 8, 10, and 12 S.U., based on the alkaline demand obtained during the titration test.

A total of 26 reactors were set up for each of the two soil and groundwater pairs to screen four reagents ( $\text{Ca}(\text{OH})_2$ , FerroBlack, HIX-NanoFe, and NaOH) as detailed in Section 4.3.1 above. The NaOH reagent was set up using six reactors containing three dosages at two soil and groundwater ratios (1:3 and 1:1) per dosage. Groundwater samples were mixed, collected, and analyzed as discussed in Section 4.3.1. The setup and the results of dissolved arsenic concentrations and geochemical parameters (pH, ORP, sulfide, iron, phosphate, and sulfate) are summarized in **Table 5B**. Arsenic reduction graphs are summarized in **Appendix H**.

#### **4.3.3 Screening Test Results**

The screening test results (**Table 5B**) are mainly evaluated from the arsenic reductions, which were estimated from the comparison between the treated reactor and control reactor. The bar graphs that show the percent reduction of dissolved arsenic between control and treatment samples are enclosed in **Appendix H**. For each groundwater and soil pair, two graphs were generated to show results of the high soil content reactors and the low soil content reactors, respectively. The following summarize the results of the reactant screening step and recommendations for reactants to be included in the rebound test.

CaSx Results: Regardless of low soil content (1:3) or high soil content (1:1) reactors, CaSx appeared to be ineffective for all treatment conditions for the MW-56D, MW-608D, and MW-609D sample pairs. The dissolved arsenic concentrations appeared to increase with an increase of the CaSx dosage. The increase may be explained by sulfide-driving arsenic mobilization by a sulfide-arsenide exchange. Therefore, CaSx was not further considered for the MW-560D and MW-606S sample pairs nor the rebound test.

$\text{Ca}(\text{OH})_2$  Results: Based on the titration results, the dosages of  $\text{Ca}(\text{OH})_2$  was added to achieve the target pH values at 8, 10, and 12 S.U. The arsenic reductions were highest for the high soil content samples and were greater than 60% for all samples except for MW-560D (a low dissolved arsenic concentration sample) that showed mobilization. The pH levels decreased by approximately 1 to 3 S.U. units from the baseline pH values at the end of the test. The decreases were likely due to the acidity generation from the reactions related to arsenic and/or calcium conversion to insoluble precipitates in the slurry. The percent reductions of dissolved arsenic were generally higher when the final pH levels were higher. The strong correlation between final pH and percent arsenic reduction is demonstrated in **Figure 4**. Therefore, maintaining an elevated pH at more than 11 S.U. would support the effective reduction of

dissolved arsenic for the high dissolved arsenic in groundwater samples when  $\text{Ca}(\text{OH})_2$  is applied.

**FerroBlack Results:** FerroBlack showed variable results according to the dissolved arsenic concentrations and soil mass in the reactors. Overall, the results show that FerroBlack can reduce the arsenic concentrations to some extent in all samples, but it is most effective for lower concentrations of dissolved arsenic in groundwater (**Appendix H**). The sample pairs with the highest dissolved arsenic concentrations in groundwater (MW-608D and MW-609D) showed less than 35% reduction in dissolved arsenic concentration. Therefore, FerroBlack was not considered for further testing.

**HIX-NanoFe Results:** The HIX-NanoFe dosages varied from 3.3 grams per kilogram (g/kg) to 604 g/kg, depending on the dissolved arsenic concentrations in the groundwater. The treatment efficiency increases with an increase in dosage and the most effective treatments were seen in the 3X dosage for MW-608D (96% for the low soil content reactor and 73% for the high soil content reactor) and MW-609D (99.8% for the low soil content reactor and 90% for the high soil content reactor).

**NaOH Results:** Unlike  $\text{Ca}(\text{OH})_2$  treatment, NaOH appeared to mobilize arsenic in all treatment reactors for the MW-560D sample pair because the arsenic results after treatment were generally higher than the arsenic concentrations in the control samples. The MW-606S sample pair showed mobilization for half the treatment reactors and had arsenic reduction values less than 45% for the remaining treatment reactors. Further, the pH levels were maintained at the same levels during the treatment period. Due to the ineffective treatment, NaOH was not considered for further testing.

Among all reagents,  $\text{Ca}(\text{OH})_2$  and HIX-NanoFe showed high treatment effectiveness. Although HIX-NanoFe generally showed more effective arsenic reduction than  $\text{Ca}(\text{OH})_2$ , the latter was selected for further testing due to the following rational.

- The dosage of HIX-NanoFe required to achieve 90% arsenic reduction is estimated to be more than 300 g/kg for the most contaminated area based on the reagent screening test, which would be impracticable to implement at AOI 7 due to fine grained site soils. A 50 g/kg dosage (a more practicable dosage to implement) would achieve only a 70% arsenic reduction at all areas. Due to the high dosage demand, HIX-NanoFe was not carried into the rebound study testing.
- $\text{Ca}(\text{OH})_2$  treatment efficiency was confirmed to strongly correlate to high pH levels. The reagent screening test showed that the dissolved arsenic concentrations can be decreased by 90% when pH levels increase above 11 S.U. Based on the amended dosage and final pH concentrations (**Figure 5**), the dosage of  $\text{Ca}(\text{OH})_2$  to maintain a pH level above 11 S.U. would be approximately 10 g/kg. To ensure the elevated pH (> 11 S.U.) can be achieved, a 25% contingency was applied to the dosage, resulting in a 12.5 g/kg dosage for the rebound test. Although  $\text{Ca}(\text{OH})_2$  has low solubility and will have to be delivered as a slurry into the subsurface, the grain size of  $\text{Ca}(\text{OH})_2$  can be reduced to an



average size of 40 microns, significantly smaller than HIX-NanoFe. Therefore,  $\text{Ca}(\text{OH})_2$  was selected for the rebound tests.

#### **4.4 Step 4 - Rebound Tests**

The rebound test evaluates long-term effectiveness of the selected treatment technology through the formation of arsenic precipitates and/or sorption of arsenic. However, the subsurface conditions, especially pH and ORP, can affect the dissolution of the precipitates or cause desorption. This test investigated whether arsenic can be released from either precipitates or sorption after the conditions induced by treatment are reversed back to the baseline conditions.

##### **4.4.1 Methodology**

The rebound test included both treatment and control samples that were set up in duplicate reactors, as detailed in **Table 6**. For each sample pair, four control reactors (two pairs of duplicates) were set up with groundwater and soil and without any reagent while the two treatment reactors (one duplicate) was set up with the same groundwater and soil sample and additional  $\text{Ca}(\text{OH})_2$ . For each sample pair, six reactors were set up as below:

- Reactor 1 – Control for Day 7 sampling
- Reactor 2 – Duplicate control for Day 7 Sampling
- Reactor 3 – Control for Day 24 Sampling
- Reactor 4 – Duplicate control for Day 24 Sampling
- Reactor 5 –  $\text{Ca}(\text{OH})_2$  treatment
- Reactor 6 - Duplicate  $\text{Ca}(\text{OH})_2$  treatment

The schedule for the rebound test is summarized below:

- Week 0 (Day 0): Reactor (control and treatment) setup
- Week 1 (Day 7): First round of groundwater sampling seven days from treatment and then groundwater replenishing with the rebound groundwater sample.
- Week 2 (Day 14): Second round of groundwater sampling seven days after the first replenishment with the rebound groundwater sample and groundwater replenishing with new volume of the rebound groundwater sample.
- Week 3(Day 24): Final groundwater and soil sampling ten days after the second replenishment.

Day 0 Activities: For the reactor setup, all reactors, groundwater samples, and pre-weighted  $\text{Ca}(\text{OH})_2$  were set up in an anaerobic chamber where oxygen was purged by nitrogen gas. The size of each reactor was 500 ml, in which approximately 350 grams of soil and a similar mass of groundwater was added into the same reactor. For the treatment reactors, approximately 4.4 grams of  $\text{Ca}(\text{OH})_2$  was added to the reactors containing groundwater and soil slurry. The reactors were tightly closed inside the anaerobic chamber. After being removed from the chamber, the reactors were sealed with paraffin wax to further eliminate oxygen infiltration.

Day 7 Activities: After one week (Day 7) after the initial setup discussed above, groundwater samples were collected from the duplicate control reactors (Reactors 1 and 2) and duplicate

treatment reactors (Reactors 5 and 6) for analysis of pH and ORP using the portable water quality, sulfide using the Hach kit, and for analysis at the SGS laboratory of metals via EPA method 6010D (antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc) and anions (sulfate and phosphate via EPA method 300.0 and 365.3, respectively) as shown in **Table 6**.

After the first round of groundwater sampling (on Day 7), the rebound groundwater sample (the groundwater sample location that showed similar geochemical conditions to its contaminated groundwater well pair but contained no arsenic and was located upgradient of the contaminated groundwater well pair) was used to replenish the reactors to the same volume so there was no headspace, as shown in the table below.

<b>Sample Pair</b>	<b>Soil Boring Location</b>	<b>Contaminated Groundwater for Initial Setup</b>	<b>Rebound Groundwater Source</b>
MW-560D soil / MW-560D groundwater	MW560D	MW-560D	MW-560D
MW-608D soil / MW-606S groundwater	MW-608D (Shallow)	MW-606S	MW-509
AOI7-BH-22-001 soil / MW-56D groundwater	AOI7-BH-22-001	MW-56D	MW-533L
MW-608D soil / MW-608D groundwater	MW-608D (Deep)	MW-608D	MW-509D
MW-609D soil / MW-609D groundwater	MW-609D	MW-609D	MW-533L

Note that MW-560D was used as the contaminated groundwater source and the rebound groundwater source in its sample pair because upgradient groundwater from MW-560D comes from the adjacent property, where there are no wells screened in the same interval as MW-560D. The reactors filled with rebound groundwater (that have concentrations below the arsenic groundwater PRG) were incubated for another seven days.

**Day 14 Activities:** During the second week (Day 14) of the rebound test, the second round of groundwater analysis was conducted by removing all the supernatants in the treatment reactors (Reactors 5 and 6) and no samples were collected from the control reactors to conserve sample volume for the Day 24 control sampling. Treatment reactor groundwater was analyzed for pH and ORP using the portable water quality, sulfide using the Hach kit, and sent to SGS for the analysis of metals via EPA method 6010D (antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc) and anions (sulfate and phosphate via EPA method 300.0 and 365.3, respectively). All of the treatment reactors were replenished with additional groundwater from the rebound groundwater source on the same day after sample collection. The reactors were then incubated for another week.

**Day 24 Activities:** At the end of the third week (Day 24), the remaining duplicate control reactors (Reactors 3 and 4) and the duplicate treatment reactors (Reactors 5 and 6) from all five sample pairs were sacrificed to collect the groundwater and soil samples. Groundwater samples



from all reactors were analyzed for pH and ORP using the portable water quality, sulfide using the Hach kit, and sent to SGS for the analysis of metals via EPA method 6010D (antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc) and anions (sulfate and phosphate via EPA method 300.0 and 365.3, respectively). The soil samples from all reactors were sent to SGS for analysis of metals only via EPA method 6010D (antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc).

Note that the full list of metals (lead, arsenic, cadmium, cobalt, copper, mercury, selenium, thallium, zinc, antimony, silver, nickel, iron, and manganese) that were analyzed during the 2017 RCRA Facility Investigation (RFI) were also included in the groundwater and soil analyses during the rebound test, as discussed above and summarized on **Table 6**. This additional analysis was performed to determine whether other metals in the soil and groundwater can be released from the subsurface during and after arsenic remediation.

All analytical laboratory reports are summarized in **Appendix C**. Data validation was not performed for any of the analyses completed during the reagent screening tests nor the rebound tests.

#### **4.4.2 Rebound Test Arsenic Results**

The arsenic reduction was evaluated according to the average concentrations between the control and treatment duplicates. The arsenic results from the rebound test are presented in **Table 7**. **Figure 6A** shows the average dissolved arsenic concentrations of duplicate samples for control and treatment on Days 7, 14, and 24. **Figure 6B** shows the percent reductions of dissolved arsenic concentration on Days 7, 14, and 24.

Day 7 Results: The results were evaluated for initial treatment efficiency. Dissolved arsenic concentration decreases were observed in all treated samples when compared with Day 7 control results. The arsenic reductions were 91% in MW-56D, 92% in MW-560D, 97% in MW-608D, 95% in MW-609D, and 44% in MW-606S. Dissolved arsenic concentrations decreased to below the arsenic groundwater PRG (1,253 ug/L) in MW-606S and MW-560D treatments. Due to the elevated concentrations in the other three treatment samples, the achieved reduction levels still could not reach the arsenic groundwater PRG. Among all treatments, pH levels were near 12 S.U., indicating that the target pH level was achieved.

Day 14 Results: Dissolved arsenic concentrations in the treatment reactors were analyzed seven days after replenishment with rebound water. The dissolved arsenic concentration results, compared with Day 7 dissolved arsenic results, provide evidence for the rebound of the arsenic concentrations after the pH levels in the treatment reactors showed a decrease as dissolved arsenic concentrations increased at Day 14. In general, pH levels were decreased to approximately 9 S.U. in all treated samples. Based on the initial dissolved arsenic concentrations, three main observations were made:

- All samples from treatment reactors increased in dissolved arsenic concentration from Day 7 to Day 14, suggesting that rebound occurred at all locations.



- The low initial dissolved arsenic concentration samples (MW-560D and MW-606S) showed lower levels of arsenic reduction (37% in MW-560D) or increased above the control concentration as seen with the MW-606S. These results show that 55% of arsenic rebounded or MW-560D and all of the arsenic rebounded/mobilized at MW-606S.
- The high initial dissolved arsenic concentration samples (MW-56D, MW-608D and MW-609D) showed that Day 14 arsenic reductions (estimated from Day 7 control and Day 14 treatment reactors, as specified in **Figures 6A and 6B**) were lower than Day 7 arsenic reductions. However, arsenic reductions for Day 14 remained above 69% for these samples. These results signify that only up to 26% of the arsenic concentrations in these samples rebounded during the replenishment with rebound groundwater.

**Day 24 Results:** Dissolved arsenic concentrations in the control and treatment reactors were analyzed seven days after the second replenishment with rebound water. The results, compared with the Day 7 and Day 14 dissolved arsenic results, provide evidence for the rebound of the arsenic concentrations after the pH levels in the treatment continued to decrease with an increase in dissolved arsenic concentrations. In general, pH levels were observed to decrease to approximately 5 to 7 S.U. in all treatment samples, except for MW-560D that had pH values around 10 S.U. The following observations were made for the Day 24 results:

- Similar to the Day 14 results, dissolved arsenic concentrations at Day 24 remained lower in the treatment samples when compared to the control, except for MW-560D that increased above the control arsenic concentration.
- All treatment reactor samples showed an increase in dissolved arsenic concentrations from Day 14 to Day 24 except for MW-606S, suggesting that rebound occurred at all locations. MW-606S had already shown rebound at Day 14.
- The low initial dissolved arsenic concentration samples (MW-560D and MW-606S) either increased above the control concentration as seen with the MW-560D or showed a lower concentration of arsenic from Day 14. These results show that all of arsenic rebounded for MW-560D and arsenic concentrations stabilized back to below the control concentration for a 19% arsenic reduction.
- High initial arsenic concentration treatment samples (MW-608D and MW-609D) showed arsenic reductions (comparing between control and treatment samples) of 70% at MW-608D and 60% at MW-609D at Day 24. This signifies that up to 9% of dissolved arsenic in these samples rebounded during the second rebound groundwater replenishment between Day 14 and Day 24. The total rebound between Day 7 and Day 24 was up to 35% for these samples. MW-56D showed an overall arsenic reduction of 32%, which results in a total rebound of 59% from Day 7.

#### **4.4.3 Geochemistry**

Phosphate and sulfate were also analyzed for all control and treatment samples (**Table 7**). The addition of  $\text{Ca}(\text{OH})_2$  reduced the phosphate concentration in all treatments. Elevated phosphate concentrations at more than 20 mg/L were observed in the control samples of MW-608D and MW-609D. The phosphate concentrations from Day 7 samples for these two sample pairs were below 1 mg/L. For the other three sample pairs, phosphate concentrations in the treatment samples were significantly lower than the phosphate concentrations in the control samples. The

phosphate concentration reductions during arsenic treatment were most likely due to the formation of calcium phosphate, which has low solubility and precipitates from the aqueous phase.

Sulfate concentrations varied among all samples but did not change greatly during the treatment duration. Elevated sulfate concentrations above 1,000 mg/L were observed in the three samples with high initial dissolved arsenic concentrations (MW-56D, MW-608D, and MW-609D). Therefore, the elevated sulfate levels did not appear to affect the arsenic reduction efficiency of  $\text{Ca(OH)}_2$ .

#### **4.4.4 Other Groundwater Metals**

In addition to arsenic, 13 dissolved metals were analyzed for all groundwater samples, as summarized in **Table 8**. The metal concentrations generally did not change significantly or decreased between the control and treatment. The metals results confirmed that the  $\text{Ca(OH)}_2$  treatment did not mobilize metals and generally showed favorable results for the concentration reduction of other metals.

#### **4.4.5 Soil Metals**

The treatability soil samples were analyzed for the 13 metals discussed above for all samples on Day 24 and the results are provided in **Table 9**. Comparing the groundwater and soil metal concentrations in the same reactors, the majority of metal mass was present as solids in the soil. This observation signifies that the mobilization of metals (other than arsenic) will not occur during the in-situ treatment of arsenic.

#### **4.5 Summary**

The rebound test confirmed that  $\text{Ca(OH)}_2$  can be an effective reagent to reduce dissolved arsenic concentrations at the Site if the elevated pH can be maintained.  $\text{Ca(OH)}_2$  can also decrease the concentrations of phosphate and other metals in the groundwater. The treatment efficiency using  $\text{Ca(OH)}_2$  would be high in the area southwestern corner of AOI 7 where high arsenic and sulfate concentrations are present in groundwater (i.e., MW-606S, MW-608D, and MW-609D). However, the treatment efficiency is correlated with pH level and dissolved arsenic concentrations. When the pH levels decreased to their baseline levels during the rebound test, the arsenic concentrations also increased towards their baseline levels indicating rebound of arsenic. This suggests that a pH greater than 11 S.U. must be maintained in order to avoid rebound of arsenic concentrations to initial concentrations after treatment.

### **5.0 BENCH SCALE TREATABILITY STUDY RESULTS**

The bench scale treatability study identified that  $\text{Ca(OH)}_2$  can decrease arsenic concentrations at the highest arsenic in groundwater area in the southwestern corner of AOI 7. The following is a summary of the bench scale treatability study observations and conclusions.

- High pH induced by  $\text{Ca(OH)}_2$  is critical for treatment effectiveness. Although a 97% reduction of dissolved arsenic concentrations was observed during the study, the arsenic groundwater PRG was not achieved for the highest arsenic concentration area

(MW-608D and MW-609D). Treatment effectiveness would require a reduction of 99.7% or greater for this area to meet the arsenic in groundwater PRG.

- The rebound test results showed that a greater than 90% arsenic concentration reduction can be achieved when the dosage at 12.5 g/kg is applied for high arsenic concentration areas. However, arsenic concentrations will begin to increase and rebound after the pH level decreases to below 11 S.U. as upgradient groundwater travels through the remediation area. An increased dosage of  $\text{Ca}(\text{OH})_2$  or multiple dosages of  $\text{Ca}(\text{OH})_2$  would be required to maintain pH greater than 11 S.U. and maintain arsenic reduction in groundwater for a greater treatment duration.
- Compared with other reagents,  $\text{Ca}(\text{OH})_2$  showed the most arsenic reduction, requires the least amount of dosage, and can be milled to a small grain size for injection feasibility. However, the target treatment interval was characterized as low permeability silt/clay and the target interval is difficult to deliver  $\text{Ca}(\text{OH})_2$  in powder form. The powder  $\text{Ca}(\text{OH})_2$  can be injected into the subsurface using fracturing technology. However, the fracturing injection can affect the stability of the railroad tracks nearby. Most importantly, fractures generated during the injection can become the conduit for groundwater migration to the porewater/surface water. The low permeability silt/clay binds and immobilizes arsenic in the soil, preventing arsenic from discharging into the porewater and subsequently the surface water.

The arsenic groundwater PRG for the site is intended for concentrations of arsenic in groundwater to be protective of porewater to an arsenic concentration of 1,253 ug/L. In March 2022, Evergreen conducted a sediment and porewater sampling event that was described in detail in the May 31, 2022 IM Progress Report. This report outlined that the 11 samples of porewater that were collected for dissolved arsenic analysis were below 1,253 ug/L. As the bench scale treatability study concluded, the high concentrations of arsenic in groundwater are found in the silt/clay layer on Site that immobilizes arsenic and prevents discharge to porewater. This conclusion was validated with the March 2022 porewater results that showed, despite high concentrations of arsenic in groundwater, the concentrations of arsenic in porewater are below PRG due to this immobilization. Additionally, Evergreen is collecting additional porewater samples from February 27, 2023 to March 3, 2023 to confirm porewater arsenic concentrations at locations immediately downgradient from the locations of high arsenic concentrations in groundwater.

Because the arsenic groundwater PRG is not being exceeded in porewater off the AOI 7 shoreline and because the bench scale treatability study concluded that arsenic in groundwater is bound and immobilized in the silt/clay layer at its current conditions, the recommended approach is to continue to monitor dissolved arsenic in groundwater at the site to verify that dissolved arsenic is not impacting human and ecological receptors. The pilot study and in-situ remediation is not recommended for further consideration.

Task	Media	Parameters	Analytical Method	Collection Method	Data Quality Objective	Sampled Locations	Depth Interval	Necessary Volume
Bulk Soil Sampling for Bench Scale	Soil	N/A	N/A	Geoprobe macrocores	Collection of soils for bench scale treatability reagent screening and rebound tests	MW-559D, MW-560D, MW-608D, MW-609D, AOI7-BH-22-001	See Table 1B	5.7 kg per location
Soil Screening for Bench Scale		COD, BOD, TOC	5220/5210/Lloyd Kahn	Geoprobe macrocores	Collection of soils for bench scale treatability baseline screening	MW-608D, MW-609D	10 to 15 ft bgs 20 to 25 ft bgs 25 to 30 ft bgs	4-oz per depth interval per location
						MW-559D, MW-560D	0 to 5 ft bgs 10 to 15 ft bgs 20 to 25 ft bgs	4-oz per depth interval per location
						AOI7-BH-22-001	5 to 10 ft bgs 15 to 20ft bgs 25 to 30 ft bgs	4-oz per depth interval per location
		Grain Size	ASTM D422	Geoprobe macrocores		MW-609D	10 to 15 ft bgs 20 to 25 ft bgs 25 to 30 ft bgs	4-oz per depth interval per location
						MW-560D	0 to 5 ft bgs 10 to 15 ft bgs 20 to 25 ft bgs	4-oz per depth interval per location
						AOI7-BH-22-001	5 to 10 ft bgs 15 to 20ft bgs 25 to 30 ft bgs	4-oz per depth interval per location
		Atterberg Limits	ASTM D4318	Shelby tube		MW-608D, MW-609D	25 to 30 ft bgs	8-oz per location
Bulk Groundwater Sampling for Bench Scale	Groundwater	N/A	N/A	Low-flow sampling	Collection of groundwater for bench scale treatability reagent screening and rebound tests	MW-560D, MW-56D	25 ft bgs	5 L per location
						MW-606S	15 ft bgs	
						MW-608D, MW-609D	33.5 ft bgs	
						MW-560, MW-509	10 ft bgs	2 L per location
						MW-509D, MW-533L	25 ft bgs	
Groundwater Screening for Bench Scale		Arsenic and Iron	6010D	Low-flow sampling	Collection of groundwater for bench scale treatability baseline screening	MW-509D, MW-531L, MW-532L, MW-533L, MW-559D, M-560D, MW-607D, MW-56D	25 ft bgs	500 ml for each sample
						MW-606S	15 ft bgs	
						MW-606D	30 ft bgs	
						MW-509	10 ft bgs	
		Manganese	6010D	Low-flow sampling		MW-608D, MW-609D	33.5 ft bgs	
						MW-560D, MW-56D	25 ft bgs	
						MW-606S	15 ft bgs	
						MW-608D, MW-609D	33.5 ft bgs	
						MW-560D, MW-56D	25 ft bgs	
Phosphate	EPA 365.3	Low-flow sampling	MW-606S	15 ft bgs				
			MW-608D, MW-609D	33.5 ft bgs				

Table 1A  
Bench Scale Treatability Study Activities Summary  
AOI 7, MHT

Task	Media	Parameters	Analytical Method	Collection Method	Data Quality Objective	Sampled Locations	Depth Interval	Necessary Volume
Groundwater Screening for Bench Scale	Groundwater	Sulfide and Sulfate	EPA 376.2/300.0	Low-flow sampling	Collection of groundwater for bench scale treatability baseline screening	MW-531L, MW-532L, MW-607D, MW-56D	25 ft bgs	500 ml for each sample
						MW-606S	15 ft bgs	
						MW-606D	30 ft bgs	
						MW-608D, MW-609D	33.5 ft bgs	

- Notes:**
- 1. COD - Chemical Oxygen Demand  
BOD - Biological Oxygen Demand  
TOC - Total Organic Carbon  
IM - Interim Measures  
N/A - Not Applicable  
ft bgs - feet below ground surface  
kg - kilograms  
oz - ounce  
L - liters  
ml - milliliters
  - 2. The soil and groundwater samples for the Bench Scale Treatability Test were homogenized for each location.

**Table 1B**  
**Bench Scale Treatability Study Sampling Plan Summary**  
**AOI 7, MHT**

Sample Pair	Soil Boring Location	Groundwater Source	Rebound Groundwater Source	Soil Sampling Interval (ft bgs)	Soil Type
MW-560D soil/ MW-560D groundwater	MW-560D	MW-560D	MW-560D	15 - 25	Silty Sand and Silty Clay
MW-608D soil/ MW-606S groundwater	MW-608D	MW-606S	MW-509	10 - 25	Silty Sand and Silty Clay
MW-608D soil/ MW-608D groundwater	MW-608D	MW-608D	MW-509D	25 - 33	Silty Clay
AOI7-BH-22-001 soil/ MW-56D groundwater	AOI7-BH-22-001 (Near MW-534L)	MW-56D	MW-533L	20 - 28	Silty Clay
MW-609D soil/ MW-609D groundwater	MW-609D	MW-609D	MW-533L	18 - 25	Silty Clay

**Notes:**

1. ft bgs - feet below ground surface

**Table 2**  
**Soil Boring and Well Construction Summary**  
**AOI 7, MHT**

Boring/Well ID	Shallow / Deep	Date of Installation	Ground Surface Elevation (ft AMSL - NAVD88)	Northing	Easting	Top of Inner Casing Elevation (ft AMSL - NAVD88)	Top of Screen Elevation (ft AMSL - NAVD88)	Bottom of Screen Elevation (ft AMSL - NAVD88)
MW-559D	Deep	5/11/2022	9.1	180555.6248	2620750.443	12.50	-10.9	-20.9
MW-560D	Deep	5/11/2022	6.6	180471.4894	2620806.607	10.22	-13.4	-23.4
MW-608D	Deep	4/4/2022	21.3	180368.7256	2620959.521	23.47	-6.7	-18.7
MW-609D	Deep	4/4/2022	20.1	180392.7755	2621013.99	22.62	-7.9	-19.9
AOI7-BH-22-001	Deep	4/5/2022	10.8	180803.5956	2621258.541	-	-	-

**Notes:**

1. ft AMSL - feet above mean sea level
2. Vertical Datum is referenced to NAVD 1988 in US Feet.
3. AOI7-BH-22-001 is a soil boring only.





**Table 3**  
**Bench Scale Treatability Study Soil Screening Analytical Results**  
**AOI 7, MHT**

Sample Location	Sample Date	Start Depth (ft)	End Depth (ft)	Arsenic	Iron	Biological Oxygen Demand (BOD)	Chemical Oxygen Demand (COD)	Total Organic Carbon (TOC)	% Total Gravel	% Total Sand	% Total Fines	Atterberg Limits			
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				Liquid Limit	Plastic Limit	Liquidity Index	Plasticity Index
MW-609D	4/4/2022	0	5	153	34,600 J	-	-	-	-	-	-	-	-	-	-
	4/5/2022	5	10	9.3	16,800 J	-	-	-	-	-	-	-	-	-	-
	4/5/2022	10	15	13.8	30,300 J	4,670 J	64,200	126,000	5.6	37.9	56.5	-	-	-	-
	4/5/2022	15	20	409	74,700 J	-	-	-	-	-	-	-	-	-	-
	4/5/2022	20	25	5.8	16,200 J	1,050 J	84,500	19,200	46.2	35.3	18.4	-	-	-	-
	4/5/2022	25	30	399	144,000 J	2,990 J	42,200	30,400	1.2	22	76.8	40	27	2.14	13
	4/5/2022	30	35	10,400	24,400 J	-	-	-	-	-	-	-	-	-	-
	4/5/2022	35	40	1,330	26,600 J	-	-	-	-	-	-	-	-	-	-
Field Duplicate (MW-608D)	4/6/2022	15	20	27.3	43,800	-	-	-	-	-	-	-	-	-	-
Equipment Blank (mg/L)	4/6/2022	-	-	<0.003	<0.1	-	-	-	-	-	-	-	-	-	-

**Notes:**

1. Samples were collected by Sanborn Head personnel on the dates indicated and were analyzed by SGS North America, Inc. (SGS) of Dayton, New Jersey. Analytical method for each analyte is provided in Table 1A of this report. A sample type of "FD" indicates a field duplicate sample. A sample type of "EB" indicates an equipment blank sample.

2. "<" indicates the analyte is not detected above laboratory reporting limits.  
"ft" indicates feet.

"J" indicates the result is estimated and may have an indeterminate bias.

"mg/kg" indicates milligrams per kilogram.

3. Data validation was performed on the samples analyzed for arsenic by Environmental Standards, Inc. of Valley Forge, Pennsylvania. All results are considered acceptable, with the understanding of the potential uncertainty (bias) in the qualified results. In some cases, Environmental Standards assigned the qualifiers noted above to the data. Refer to the Data Validation Summary Reports for further details.

**Table 4A**  
**Bench Scale Treatability Study Groundwater Screening Analytical Results**  
**AOI 7, MHT**

Location	Sample Date	Arsenic	Iron	Manganese	Phosphate	Sulfate	Sulfide
		µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
Groundwater PRG		1,253	NS	NS	NS	NS	NS
MW-531L	5/25/2022	202,000	45,600	-	-	<2	3.6
MW-532L	5/25/2022	1,430,000	60,300	-	-	1,700	7.1
MW-559D	5/26/2022	297	41,500	-	-	899	<2
MW-560D	5/26/2022	14,600	52,800	-	-	263	<2
MW-560D	6/3/2022	<6	10,400	237	<0.1	383	-
MW-560D (A)	6/28/2022	26,100	-	-	-	-	-
MW-560D (B)	6/28/2022	20,700	-	-	-	-	-
MW-560D (C)	6/28/2022	15,700	-	-	-	-	-
MW-56D	5/25/2022	386,000	115,000	-	-	<2	5.4
MW-56D	6/3/2022	258,000	55,600	1,220	1.3	<2	-
MW-606S	6/3/2022	<30	55,400	1,700	<0.1	2,560	-
MW-606S (A)	6/28/2022	6,810	-	-	-	-	-
MW-606S (B)	6/28/2022	6,550	-	-	-	-	-
MW-606S (C)	6/28/2022	6,210	-	-	-	-	-
MW-606D	5/25/2022	636,000	319,000	-	-	8,860	6.0
MW-607D	5/26/2022	111,000	56,500	-	-	8.3	3.5
MW-608D	5/24/2022	494,000	73,600	-	-	-	-
MW-608D	6/3/2022	680,000	64,400	1,980	3.6	2,100	-
MW-608D (A)	6/9/2022	82,200	47,800	-	-	1,730	2.4
MW-608D (B)	6/9/2022	207,000	52,400	-	-	1,800	4.3
MW-609D	5/24/2022	633,000	108,000	-	-	-	-
MW-609D	6/3/2022	564,000	83,000	1,320	3.5	1,970	-
MW-609D (A)	6/9/2022	649,000	90,000	-	-	1,740	5.3
MW-609D (B)	6/9/2022	638,000	83,200	-	-	1,720	5.9
Field Duplicate (MW-532L)	5/25/2022	1,380,000	51,700	-	-	-	-

**Notes:**

1. Samples were collected by Sanborn Head personnel during the May 24, 2022 to May 26, 2022, June 9, 2022, and June 28, 2022 events. Samples from June 3, 2022 were submitted by Terra Systems lab of Claymont, Delaware. Samples were analyzed by SGS North America, Inc. (SGS) of Dayton, New Jersey. The analytical method for each analyte is provided in Table 1A of this report. A sample type of "FD" indicates a field duplicate sample.

2. "Groundwater PRG" is the preliminary remediation goal (PRG) for dissolved arsenic in groundwater developed by Honeywell International, Inc. (Honeywell) for the protection of porewater.

3. Gray shaded values indicate an exceedance of the Groundwater PRG.  
 "<" indicates the analyte is not detected above laboratory reporting limits.  
 "NS" indicates no standard.  
 "µg/L" indicates micrograms per liter.  
 "-" indicates the parameter was not measured.

4. A and B for MW-608D and MW-609D were collected using a hydrosleeve passive sampler.

5. A, B,C for MW-560D and MW-606S were collected during the resampling of the bulk samples under nitrogen blanket and are representative of samples collected at the beginning (A), middle (B), and end (C) of the groundwater sampling.

6. Data validation was performed on the May 2022 samples that were analyzed for dissolved arsenic and provided in this table by Environmental Standards, Inc. of Valley Forge, Pennsylvania. All results are considered acceptable. Refer to the Data Validation Summary Reports for further details.

**Table 4B**  
**Bench Scale Treatability Study Groundwater Screening Results - Geochemical Parameters**  
**AOI 7, MHT**

Location	Sample Date	ORP	pH
		mV	S.U.
MW-509	5/24/2022	-119	6.78
MW-509D	5/24/2022	-135	6.30
MW-532L	5/25/2022	-212	7.00
MW-533L	5/24/2022	27	6.47
MW-559D	5/26/2022	-111	6.48
MW-560	5/26/2022	453	3.37
MW-560D	5/26/2022	-107	6.13
MW-606D	5/25/2022	-152	6.50
MW-606S	5/25/2022	-128	6.59
MW-608D	5/24/2022	-190	6.89
MW-609D	5/24/2022	-191	6.81

**Notes:**

1. Measurements were collected by Sanborn Head personnel on the dates indicated via low-flow groundwater sampling methods.
2. Oxidation reduction potential (ORP) is presented in millivolts (mV) and pH is presented in standard units (S.U.).

**Table 5A**  
**Reagent Screening Test Setup**  
**AOI 7, MHT**

	MW-608D Soil and MW-606S Groundwater				MW-560D Soil and MW-560D Groundwater			
Treatment	Soil Mass	Groundwater Mass	Reagent	Reagent Dosage	Soil Mass	Groundwater Mass	Reagent	Reagent Dosage
	g	g	g	g/kg	g	g	g	g/kg
Control 1	15	56.8	-	-	15	54.7	-	-
	40	43.7	-	-	40	40.2	-	-
Control 2	15	56.6	-	-	15	56.6	-	-
	40	83.6	-	-	40	83.6	-	-
Ca(OH) <sub>2</sub> pH 8	15	56.4	0.031	2.1	15	55.2	0.1	6.7
	40	43.8	0.07	1.8	40	39.3	0.15	3.8
Ca(OH) <sub>2</sub> pH 10	15	58.1	0.05	3.3	15	54.8	0.2	13.3
	40	46.3	0.102	2.6	40	40.4	0.25	6.3
Ca(OH) <sub>2</sub> pH 12	15	55.9	0.141	9.4	15	55.4	0.3	20.0
	40	45.3	0.181	4.5	40	38.8	0.4	10.0
NaOH pH 8	15	55.6	0.16	10.7	15	54.9	0.2	13.3
	40	44.6	0.37	9.3	40	39.6	0.25	6.3
NaOH pH 10	15	56.8	0.3	20.0	15	54.9	0.4	26.7
	40	44.2	0.52	13.0	40	43.4	0.5	12.5
NaOH pH 12	15	56.5	0.76	50.7	15	54.0	0.6	40.0
	40	45.2	1.13	28.3	40	38.9	0.75	18.8
HIX NanoFe 1X	15	56.5	0.163	10.9	15	56.5	0.2	13.3
	40	42.8	0.131	3.3	40	42.8	0.2	5.0
HIX NanoFe 2X	15	56.8	0.311	20.7	15	56.8	0.4	26.7
	40	44.8	0.261	6.5	40	44.8	0.4	10.0
HIX NanoFe 3X	15	57.0	0.47	31.3	15	57.0	0.8	53.3
	40	44.4	0.394	9.9	40	44.4	0.8	20.0
Ferroblack Fe+ 4%	15	60.4	1.81	120.7	15	53.9	1.8	120.0
	40	43.0	1.22	30.5	40	39.1	1.28	32.0
Ferroblack Fe+ 7%	15	53.9	3.23	215.3	15	52.4	3.15	210.0
	40	43.1	2.24	56.0	40	39.2	2.24	56.0

**Table 5A**  
**Reagent Screening Test Setup**  
**AOI 7, MHT**

	AOI7-BH-22-001 Soil and MW-56D Groundwater				MW-608D Soil and MW-608D Groundwater			
Treatment	Soil Mass	Groundwater Mass	Reagent	Reagent Dosage	Soil Mass	Groundwater Mass	Reagent	Reagent Dosage
	g	g	g	g/kg	g	g	g	g/kg
Control 1	15	54	-	-	15	45	-	-
	40	38	-	-	40	45	-	-
Control 2	15	54	-	-	15	32	-	-
	40	39	-	-	40	32	-	-
Ca(OH) <sub>2</sub> pH 8	15	54	0.100	6.7	15	45	0.05	3.3
	40	39	0.150	3.8	40	32	0.10	2.5
Ca(OH) <sub>2</sub> pH 10	15	54	0.200	13.3	15	45	0.12	8.0
	40	37	0.250	6.3	40	32	0.28	7.0
Ca(OH) <sub>2</sub> pH 12	15	54	0.300	20.0	15	45	0.32	21.3
	40	39	0.400	10.0	40	32	0.45	11.3
CaSx 1X	15	54	0.201	13.4	15	45	0.48	32.1
	40	38	0.247	6.2	40	32	0.59	14.8
CaSx 2X	15	53	0.402	26.8	15	45	0.96	64.2
	40	38	0.494	12.3	40	32	1.18	29.6
CaSx 3X	15	53	0.604	40.2	15	45	1.45	96.4
	40	37	0.740	18.5	40	32	1.77	44.3
HIX NanoFe 1X	15	54	0.200	13.3	15	45	3.02	201.5
	40	38	0.200	5.0	40	30	2.52	63.0
HIX NanoFe 2X	15	53	0.400	26.7	15	45	6.04	402.9
	40	37	0.400	10.0	40	30	5.04	125.9
HIX NanoFe 3X	15	52	0.800	53.3	15	45	9.07	604.4
	40	35	0.800	20.0	40	30	7.55	188.9
Ferroblack Fe+ 4%	15	52	1.800	120.0	15	45	1.80	120.0
	40	37	1.280	32.0	40	32	1.28	32.0
Ferroblack Fe+ 7%	15	51	3.150	210.0	15	45	3.15	210.0
	40	37	2.240	56.0	40	32	2.24	56.0

**Table 5A**  
**Reagent Screening Test Setup**  
**AOI 7, MHT**

	MW-609D Soil and MW-609D Groundwater			
Treatment	Soil Mass	Groundwater Mass	Reagent	Reagent Dosage
	g	g	g	g/kg
Control 1	15	59.8	-	-
	40	41.4	-	-
Control 2	15	55.4	-	-
	40	42.0	-	-
Ca(OH) <sub>2</sub> pH 8	15	56.2	0.07	4.7
	40	41.5	0.04	1.0
Ca(OH) <sub>2</sub> pH 10	15	55.8	0.12	8.0
	40	42.5	0.10	2.5
Ca(OH) <sub>2</sub> pH 12	15	56.4	0.25	16.7
	40	43.0	0.22	5.5
CaSx 1X	15	55.2	0.42	27.8
	40	41.6	0.51	12.8
CaSx 2X	15	54.6	0.96	63.9
	40	40.5	1.02	25.6
CaSx 3X	15	54.4	1.25	83.3
	40	40.4	1.53	38.3
HIX NanoFe 1X	15	54.0	2.51	167.1
	40	41.2	2.09	52.2
HIX NanoFe 2X	15	51.7	5.01	334.2
	40	38.9	4.18	104.4
HIX NanoFe 3X	15	50.8	7.52	501.3
	40	37.8	6.27	156.6
Ferroblack Fe+ 4%	15	54.2	1.80	120.0
	40	40.3	1.28	32.0
Ferroblack Fe+ 7%	15	52.1	3.15	210.0
	40	39.0	2.24	56.0

**Table 5A**  
**Reagent Screening Test Setup**  
**AOI 7, MHT**

**Notes:**

Ca(OH)<sub>2</sub> - Hydrated lime

NaOH - Sodium Hydroxide

HIX NanoFe - Ion-exchange resin

Ferrobblack Fe+ - Reagent for metals removal

CaSx - Calcium polysulfide

g - grams

g/kg - grams per kilogram



**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

AOI7-BH-22-001 Soil and MW-56D Groundwater									
Treatment	Soil Mass	Groundwater Mass	pH	ORP	Arsenic	Sulfide	Ferrous Iron	Phosphate	Sulfate
	g	g	S.U.	mV	mg/L	mg/L	mg/L	mg/L	mg/L
Control 1	15	54	6.7	-107	142	<0.01	8.5	115	2,200
	40	38	6.7	-139	91	<0.01	105	135	1,000
Control 2	15	54	6.8	-137	168	0.1	80	NA	400
	40	39	6.7	-137	124	0.1	60	NA	800
Ca(OH) <sub>2</sub> pH 8	15	54	7.2	-158	114	-	5	-	3,000
	40	39	7.3	-173	73	-	20	-	4,000
Ca(OH) <sub>2</sub> pH 10	15	54	10.4	-	54	-	30	-	6,000
	40	37	9.2	-59	48	-	10	-	4,000
Ca(OH) <sub>2</sub> pH 12	15	54	12.0	-191	8.8	-	2	-	4,000
	40	39	11.9	-162	4.0	-	30	-	2,000
CaSx 1X	15	54	7.0	-147	167	0.1	29.5	-	2,000
	40	38	6.8	-142	109	0.2	38	-	4,000
CaSx 2X	15	53	7.1	-79	184	0.4	14	-	4,000
	40	38	7.0	-119	134	<0.01	18.5	-	4,000
CaSx 3X	15	53	7.3	-156	232	<0.01	23.5	-	6,000
	40	37	7.1	-110	213	0.5	26.5	-	5,000
HIX NanoFe 1X	15	54	6.7	-126	67	-	236	62	35,000
	40	38	6.6	-135	81	-	80	1240	1,000
HIX NanoFe 2X	15	53	6.7	-128	56	-	630	87	1,000
	40	37	6.7	-122	50	-	580	70	1,000
HIX NanoFe 3X	15	52	6.7	-80	46	-	260	19	2,500
	40	35	6.6	-116	46	-	255	10.5	1,500
Ferroblack Fe+ 4%	15	52	6.7	-140	96	0.1	390	-	4,000
	40	37	6.6	-88	84	0.1	55	-	1,000
Ferroblack Fe+ 7%	15	51	6.8	-124	58	0.1	100	-	500
	40	37	6.8	-120	68	0.2	45	-	1,000

**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

MW-560D Soil and MW-560D Groundwater									
Treatment	Soil Mass	Groundwater Mass	pH	ORP	Arsenic	Sulfide	Ferrous Iron	Phosphate	Sulfate
	g	g	S.U.	mV	mg/L	mg/L	mg/L	mg/L	mg/L
Control 1	15	54.7	6.9	246	1.32	0.06	24	1.22	2,000
	40	40.2	6.4	208	0.41	0.95	60	17.75	1,500
Control 2	15	56.6	6.8	306	0.81	0.15	1.35	1.1	300
	40	83.6	6.5	178	0.24	0.1	<0.125	0.78	1,050
Ca(OH) <sub>2</sub> pH 8	15	55.2	7.2	256	2.07	-	20	1.95	1,400
	40	39.3	7.6	158	0.80	-	8.5	0.5	900
Ca(OH) <sub>2</sub> pH 10	15	54.8	7.5	249	3.27	-	0.6	3	200
	40	40.4	8.6	113	1.04	-	8.25	0.65	800
Ca(OH) <sub>2</sub> pH 12	15	55.4	10.6	52	2.18	-	0.14	0.85	350
	40	38.8	9.8	-33	2.78	-	3.2	1.95	600
NaOH pH 8	15	54.9	8.5	191	3.50	-	7.8	3.8	1,350
	40	39.6	9.5	-37	10.40	-	22.5	16.5	1,200
NaOH pH 10	15	54.9	9.7	114	6.78	-	1.2	13.7	950
	40	43.4	10.2	-129	13.19	-	3.2	41	1,350
NaOH pH 12	15	54.0	12.4	-85	33.40	-	2.6	62.5	2,750
	40	38.9	11.5	-108	73.28	-	4	99.5	1,600
HIX NanoFe 1X	15	56.5	6.8	245	0.42	0.1	0.56	<0.02	450
	40	42.8	6.6	259	0.62	0.15	1.1	2.3	250
HIX NanoFe 2X	15	56.8	6.6	325	0.45	0.05	2.55	0.05	550
	40	44.8	6.5	223	0.35	0.35	0.75	0.65	550
HIX NanoFe 3X	15	57.0	6.6	336	0.29	0.1	0.75	0.16	400
	40	44.4	6.6	178	0.25	0.05	1.1	2.78	500
Ferroblack Fe+ 4%	15	53.9	7.0	325	<0.074	0.2	0.8	0.02	200
	40	39.1	6.6	109	0.21	0.3	6.45	0.32	2,650
Ferroblack Fe+ 7%	15	52.4	7.3	306	0.09	<0.05	1.1	<0.02	350
	40	39.2	6.8	30	0.13	0.25	8.05	0.56	400

**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

MW-608D Soil and MW-606S Groundwater									
Treatment	Soil Mass	Groundwater Mass	pH	ORP	Arsenic	Sulfide	Ferrous Iron	Phosphate	Sulfate
	g	g	S.U.	mV	mg/L	mg/L	mg/L	mg/L	mg/L
Control 1	15	56.8	6.5	226	0.23	<0.1	60	<0.02	14,000
	40	43.7	6.6	-47	0.63	0.4	915	<0.02	2,900
Control 2	15	56.6	6.7	261	<0.073	<0.1	54	<0.02	2,900
	40	83.6	6.6	91	<0.075	<0.1	4.1	<0.02	2,700
Ca(OH) <sub>2</sub> pH 8	15	56.4	7.2	278	0.15	-	0.3	0.24	5,500
	40	43.8	7.4	-59	0.13	-	155	0.38	3,600
Ca(OH) <sub>2</sub> pH 10	15	58.1	7.5	261	0.14	-	0.34	0.02	2,400
	40	46.3	8.4	66	<0.073	-	9	0.2	2,400
Ca(OH) <sub>2</sub> pH 12	15	55.9	10.0	101	0.18	-	<0.02	0.14	3,200
	40	45.3	10.3	1	0.12	-	12.5	0.2	3,200
NaOH pH 8	15	55.6	7.8	221	0.15	-	0.3	0.46	4,000
	40	44.6	8.0	78	0.20	-	2.3	0.54	4,200
NaOH pH 10	15	56.8	7.1	224	0.33	-	<0.02	0.54	3,000
	40	44.2	9.0	15	0.32	-	2.7	0.96	5,400
NaOH pH 12	15	56.5	11.6	-12	1.08	-	2.24	0.64	2,800
	40	45.2	12.1	-162	2.84	-	1.3	0.88	3,800
HIX NanoFe 1X	15	56.5	6.6	257	<0.076	0.2	1.15	<0.02	1,200
	40	42.8	6.6	276	<0.075	0.2	0.85	<0.02	2,400
HIX NanoFe 2X	15	56.8	6.8	288	<0.075	<0.1	2.4	<0.02	5,900
	40	44.8	6.6	293	<0.073	<0.1	1.25	<0.02	3,200
HIX NanoFe 3X	15	57.0	6.7	283	<0.074	<0.1	0.9	<0.02	2,100
	40	44.4	6.6	260	<0.074	1.4	2.7	1.16	2,300
Ferroblack Fe+ 4%	15	60.4	6.9	249	<0.075	<0.1	3.8	-	5,400
	40	43.0	6.7	-48	<0.073	<0.1	8	-	1,400
Ferroblack Fe+ 7%	15	53.9	7.2	248	<0.074	<0.1	1.44	-	1,900
	40	43.1	6.8	77	<0.074	<0.1	8.95	-	3,000

**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

MW-608D Soil and MW-608D Groundwater									
Treatment	Soil Mass	Groundwater Mass	pH	ORP	Arsenic	Sulfide	Ferrous Iron	Phosphate	Sulfate
	g	g	S.U.	mV	mg/L	mg/L	mg/L	mg/L	mg/L
Control 1	45	15	6.9	202	583	2,500	0.1	98	85
	45	15	6.9	-82	458	2,800	0.8	52	145
Control 2	32	40	6.7	-56	568	2,700	0.2	60	75
	32	40	6.6	3	683	4,200	0.6	12	110
Ca(OH) <sub>2</sub> pH 8	45	15	7	-1	548	2,500	-	-	12
	32	40	6.9	-87	560	2,800	-	-	45
Ca(OH) <sub>2</sub> pH 10	45	15	7.1	235	485	3,700	-	-	8.5
	32	40	9.2	110	360	2,000	-	-	5
Ca(OH) <sub>2</sub> pH 12	45	15	9.5	44	395	2,100	-	-	5.5
	32	40	10.8	-65	140	1,800	-	-	5
CaSx 1X	45	15	7.6	-82	573	2,600	0.8	-	90
	32	40	7.3	-134	538	3,000	1.2	-	100
CaSx 2X	45	15	7.7	-59	788	2,100	1.7	-	20
	32	40	7.5	-122	678	2,600	2	-	70
CaSx 3X	45	15	7.9	-138	828	1,300	2.6	-	55
	32	40	7.9	-58	1780	4,500	5.4	-	145
HIX NanoFe 1X	45	15	7.1	-70	258	2,500	0.7	84	135
	30	40	6.8	-16	410	2,400	0.8	476	160
HIX NanoFe 2X	45	15	7.1	-104	74	1,600	1	22	35
	30	40	6.8	-106	100	1,500	0.8	22	200
HIX NanoFe 3X	45	15	6.8	186	24	4,200	0.5	22	155
	30	40	6.5	-46	154	2,300	0.7	54	60
Ferroblack Fe+ 4%	45	15	6.9	-134	388	2,600	0.7	-	100
	32	40	6.8	-161	488	2,300	0.6	-	270
Ferroblack Fe+ 7%	45	15	6.9	-143	425	2,700	0.8	-	215
	32	40	6.7	-152	395	2,700	0.8	-	165

**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

MW-609D Soil and MW-609D Groundwater									
Treatment	Soil Mass	Groundwater Mass	pH	ORP	Arsenic	Sulfide	Ferrous Iron	Phosphate	Sulfate
	g	g	S.U.	mV	mg/L	mg/L	mg/L	mg/L	mg/L
Control 1	15	59.8	6.7	-63	378	0.6	95	21	1,500
	40	41.4	6.6	-151	380	1.7	165	17.4	2,000
Control 2	15	55.4	6.9	-117	299	0.2	42	8.4	2,200
	40	42.0	6.8	-169	285	0.2	4.5	<0.02	4,400
Ca(OH) <sub>2</sub> pH 8	15	56.2	6.9	-146	371	-	176	-	1,300
	40	41.5	6.9	-171	367	-	8	-	2,200
Ca(OH) <sub>2</sub> pH 10	15	55.8	6.8	-133	321	-	10	-	2,500
	40	42.5	6.9	-140	257	-	40	-	3,300
Ca(OH) <sub>2</sub> pH 12	15	56.4	8.9	-123	201	-	75	-	1,400
	40	43.0	8.6	14	131	-	80	-	1,400
CaSx 1X	15	55.2	7.4	-82	387	0.4	30	-	2,100
	40	41.6	7.4	-94	371	0.7	50	-	1,900
CaSx 2X	15	54.6	7.6	-120	534	1.6	70	-	2,200
	40	40.5	7.5	-144	589	1.4	90	-	2,100
CaSx 3X	15	54.4	8.0	-166	733	2.0	35	-	3,800
	40	40.4	8.2	-203	687	1.9	70	-	7,100
HIX NanoFe 1X	15	54.0	6.8	118	84	1.0	75	39	4,100
	40	41.2	6.7	-159	143	5.0	95	42	3,000
HIX NanoFe 2X	15	51.7	6.7	-81	84	0.7	45	74	2,600
	40	38.9	6.8	-25	18	0.5	40	42	800
HIX NanoFe 3X	15	50.8	6.8	29	0.8	0.2	28	1	1,800
	40	37.8	6.9	114	33	0.3	16	32	2,300
Ferroblack Fe+ 4%	15	54.2	7.0	-152	334	0.6	155	-	4,000
	40	40.3	6.7	-143	316	0.5	145	-	2,700
Ferroblack Fe+ 7%	15	52.1	7.0	-152	338	0	25	-	1,400
	40	39.0	6.7	-166	332	0.4	65	-	5,200

**Table 5B**  
**Reagent Screening Test Results**  
**AOI 7, MHT**

**Notes:**

1. Arsenic was analyzed in the SGS North America, Inc. of Dayton, NJ laboratory via USEPA method 6010D for all arsenic samples. The arsenic values presented in this table have been corrected for dilution from the treatability study samples.
2. Sulfide, ferrous iron, phosphate, and sulfate were analyzed using Hach methods described within the Bench Scale Treatability Study Report.
- 3: "-": Samples were not collected according to the IM workplan
- 4: NA: Not analyzed because sample volume was not sufficient for analysis
5.  $\text{Ca}(\text{OH})_2$  - Hydrated lime  
NaOH - Sodium hydroxide  
HIX NanoFe - Ion-exchange resin  
Ferroblack  $\text{Fe}^+$  - Reagent for metals removal  
CaSx - Calcium polysulfide  
g - grams  
S.U. - Standard Units  
mV - millivolts  
mg/L - milligram per liter

**Table 6**  
**Rebound Test Setup**  
**AOI 7, MHT**

Reactor Number	Treatment Reactor ID	Groundwater	Soil	Groundwater	Soil	Groundwater	Soil	Groundwater	Soil	Groundwater	Soil	Groundwater <sup>1,2</sup>			Soil - Analytical <sup>3</sup>
		MW-606S	MW-608D	MW-560D		MW-608D		MW-56D	AOI7-BH-22-001	MW-609D					
		ml	g	ml	g	ml	g	ml	g	ml	g	Day 7	Day 14	Day 24	Day 24
1	C1	365	350	340	350	342	350	328	350	350	350	√			
2	C1-DUP	369	350	338	350	340	350	324	350	360	350	√			
3	C3	367	350	346	350	342	350	325	350	356	350			√	√
4	C3-DUP	374	350	339	350	338	350	357	350	358	350			√	√
5	T3	366	350	337	350	342	350	330	350	358	350	√	√	√	√
6	T3-DUP	365	350	339	350	338	350	323	350	362	350	√	√	√	√
5-Replenish	T3	244	-	178	-	219	-	199	-	245	-				
6-Replenish	T3-DUP	225	-	151	-	223	-	252	-	256	-				
5-Replenish	T3	289	-	215	-	257	-	248	-	253	-	√	√	√	√
6-Replenish	T3-DUP	262	-	227	-	256	-	226	-	258	-	√	√	√	√

**Notes:**

<sup>1</sup>The groundwater was analyzed for pH, oxidation-reduction potential (ORP), and sulfide using Hach kit or meter.

<sup>2</sup>The analytical groundwater analyses included metals and anions. Metals include antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc. Anions include sulfate and phosphate.

<sup>3</sup>The analytical soil samples included metals. Metals included antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, zinc.

**Abbreviations:**

ml - milliliter

C - control

DUP - duplicate

T - treatment

g - gram

**Table 7**  
**Rebound Test Groundwater Results - Arsenic and Geochemical Parameters**  
**AOI 7, MHT**

Sample Type	Control or Rebound	Day	Arsenic	Phosphate	Sulfate	pH	ORP
			µg/L	mg/L	mg/L	S.U.	mV
MW-560D Soil and MW-560D Groundwater							
	Control	7	4,710	1.6	-	6.8	181
FD	Control	7	3,480	1.6	-	6.5	176
	Control	24	1,080	0.33	831	6.1	194
FD	Control	24	1,510	0.38	864	6.2	174
	Rebound	7	324	<0.25	-	12.1	-21
FD	Rebound	7	346	<0.05	233	12.3	-128
	Rebound	14	1,730	<0.1	-	11.6	144
FD	Rebound	14	1,650	<0.1	242	11.5	101
	Rebound	24	7,290	0.55	330	9.8	99
FD	Rebound	24	7,720	0.56	444	9.9	86
MW-608D Soil and MW-606S Groundwater							
	Control	7	170	0.12	2,820	6.6	68
FD	Control	7	147	0.32	-	6.6	120
	Control	24	443	1.1	3,090	6.6	50
FD	Control	24	291	0.29	3,060	6.4	77
	Rebound	7	84.3	<0.05	2,180	12.2	-125
FD	Rebound	7	93.7	0.078	2,460	11.8	-111
	Rebound	14	277	<0.1	1,870	9.2	123
FD	Rebound	14	660	0.11	1,840	2.9	391
	Rebound	24	330	0.15	1,620	6.6	73
	Rebound	24	264	0.22	1380	4.3	125
AOI7-BH-22-001 Soil and MW-56D Groundwater							
	Control	7	77,000	11.4	571	7	-60
FD	Control	7	72,000	<0.1	667	6.8	64
	Control	24	63,300	1.5	866	5.9	-6
FD	Control	24	77,200	2.0	2,220	6.8	170
	Rebound	7	7,390	<0.1	270	11.8	-253
FD	Rebound	7	5,640	<0.1	221	11.8	-219
	Rebound	14	20,100	1.7	210	9.6	11
FD	Rebound	14	15,600	1.9	313	9.9	-29
	Rebound	24	46,500	5.6	287	5	73
FD	Rebound	24	49,000	5.4	156	7.1	21
MW-608D Soil and MW-608D Groundwater							
	Control	7	377,000	117	2,110	6.5	195
FD	Control	7	422,000	128	2,000	6.6	182
	Control	24	378,000	23.9	2,410	6.5	137
FD	Control	24	328,000	21.8	2,390	6.6	69
	Rebound	7	9,670	0.91	1,940	12.1	-15
FD	Rebound	7	16,500	0.70	1,910	12.2	-312
	Rebound	14	92,500	5.5	2,730	8.8	107
FD	Rebound	14	75,100	4.3	2,700	9.4	89
	Rebound	24	101,000	12.8	3,190	6.7	106
FD	Rebound	24	111,000	12.4	3,250	7.6	69
MW-609D Soil and MW-609D Groundwater							
	Control	7	245,000	59.6	1,920	6.7	5
FD	Control	7	198,000	30.8	2,050	6.7	-41
	Control	24	284,000	5.6	2,210	6.5	-42
FD	Control	24	172,000	4.8	1,970	6.7	-61
	Rebound	7	13,500	<0.1	1,730	12.1	-200
FD	Rebound	7	8,810	0.22	1,780	12.1	-198
	Rebound	14	68,900	2.0	1,310	9	39
FD	Rebound	14	71,700	2.4	1,320	9	64
	Rebound	24	106,000	6.3	1,020	7.2	-74
FD	Rebound	24	75,300	8.2	661	4.2	151

**Notes:**

1. Samples were collected by Sanborn Head personnel, and treated by Terra Systems lab of Claymont, Delaware. Samples were submitted to SGS North America, Inc. (SGS) of Dayton, New Jersey 7, 14, and 24 days after treatment and analyzed for arsenic by United States Environmental Protection Agency (USEPA) Method 6010D, phosphate by USEPA Method 365.3, and sulfate by USEPA Method 300.0. Terra Systems measured pH and ORP prior to submittal to SGS. A sample type of "FD" indicates a field duplicate sample.

2. "<" indicates the analyte is not detected above laboratory reporting limits.

"-" indicates no sample.

"µg/L" indicates micrograms per liter.

"mg/L" indicates milligrams per liter.

"S.U." indicates standard units.

"mV" indicates millivolts.



**Table 8**  
**Rebound Test Groundwater Results - Metals**  
**AOI 7, MHT**

Sample Type	Control or Treatment	Day	Concentrations (µg/L)												
			Antimony	Cadmium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
MW-560D Soil and MW-560D Groundwater															
	Control	7	24.6	<6	<100	<20	<200	<6	2,530	<0.2	<20	<20	<20	<20	146
FD	Control	7	<30	<3	<50	<10	557	4.3	3,520	<0.2	15.4	<10	<10	<10	128
	Control	24	<30	<3	<50	<10	1,800	<3	4,260	<0.2	14.2	<10	<10	<10	131
FD	Control	24	<30	<3	<50	<10	2,840	<3	5,340	<0.2	14.3	<10	<10	<10	124
	Treatment	7	<60	<3	<50	55.4	<100	<30	<15	<0.2	54.3	13.1	<10	<10	21.8
FD	Treatment	7	<60	<3	<50	49.6	<100	<30	<15	<0.2	49.7	<10	<10	<10	21.0
	Treatment	14	<6	<3	<50	35.1	<100	3.4	<15	<0.2	110	34.5	<10	<10	<20
FD	Treatment	14	<6	<3	<50	41.7	<100	4.5	<15	<0.2	90.1	34.9	<10	<10	40.6
	Treatment	24	<12	<3	<50	17.0	<100	<3	<15	<0.2	101	14.0	<10	<10	<20
FD	Treatment	24	13.3	14.5	<50	31.1	<100	<3	<15	<0.2	114	26.6	<10	<10	<20
MW-608D Soil and MW-606S Groundwater															
	Control	7	<120	4.0	<50	<10	8,070	<60	3,140	<0.2	44.9	<200	<10	<200	424
FD	Control	7	<120	3.8	<50	<10	3,060	<60	3,290	0.35	50.3	<200	<10	<200	359
	Control	24	<120	3.7	<50	<10	40,300	<60	3,590	<0.2	43.3	<200	<10	<200	126
FD	Control	24	<60	3.4	<50	<10	27,100	<30	3,600	<0.2	47.5	<100	<10	<100	248
	Treatment	7	<60	<3	<50	12.9	201	<30	<15	<0.2	20.6	241	<10	<100	<20
FD	Treatment	7	<60	<3	<50	11.0	222	<30	<15	<0.2	<10	239	<10	<100	<20
	Treatment	14	<60	<3	<50	19.8	203	<30	<15	<0.2	16.2	157	<10	<100	<20
FD	Treatment	14	<60	<15	<250	<50	<500	<30	<75	<0.2	<50	128	<50	<100	<100
	Treatment	24	<60	<3	<50	<10	119	<30	<15	<0.2	<10	105	<10	<100	<20
FD	Treatment	24	<30	<3	<50	<10	<100	<15	<15	<0.2	<10	82.1	<10	<50	<20
MW-608D Soil and MW-608D Groundwater															
	Control	7	302	<300	<50	<10	2,180	129	1,030	0.34	47.9	<100	<10	<100	110
FD	Control	7	176	<300	<50	<10	2,270	148	894	0.48	31.9	<100	<10	<100	38.7
	Control	24	<60	<300	<50	<10	2,190	40.8	884	<0.2	36.2	<100	<10	<1000	38.8
FD	Control	24	<60	<300	<50	<10	4,880	<30	968	<0.2	31.2	<100	<10	<1000	<20
	Treatment	7	<60	<30	<50	<10	196	<30	<15	3.3	33.2	<100	<10	<100	<20
FD	Treatment	7	137	<30	<50	<10	173	<30	<15	13.9	25.9	138	<10	<100	<20
	Treatment	14	212	70.4	<50	<10	303	<60	<15	<0.2	21.9	<200	<10	<200	23.2
FD	Treatment	14	173	<60	<50	<10	295	62.0	<15	<0.2	26.3	<200	<200	<200	<20
	Treatment	24	214	<60	<50	<10	181	<60	119	<0.2	<10	<200	<10	<200	<20
FD	Treatment	24	315	<60	<50	<10	237	<60	111	<0.2	<10	<200	<10	<200	<20
MW-609D Soil and MW-609D Groundwater															
	Control	7	245	<150	<50	<10	829	33.9	1,420	<0.2	38.7	<100	<10	<100	231
FD	Control	7	145	<150	<50	<10	3,600	<30	1,530	<0.2	25.8	<100	<10	<100	80.9
	Control	24	<60	<300	<50	<10	6,710	<30	2,070	<0.2	27.1	<100	<10	<1000	113
FD	Control	24	<60	187	<50	<10	4,270	<30	1,660	<0.2	17.6	<100	<10	<100	50.8
	Treatment	7	<60	<30	<50	<10	<100	<30	<15	0.30	19.0	<100	<10	<100	<20
FD	Treatment	7	64.4	<30	<50	<10	<100	<30	<15	0.35	14.0	<100	<10	<100	<20
	Treatment	14	<120	<60	<50	<10	137	<60	<15	<0.2	30.3	<200	<10	46.9	<20
FD	Treatment	14	<120	<60	<50	<10	147	<60	<15	<0.2	21.3	<200	<10	48.2	<20
	Treatment	24	96.6	<150	<50	<10	<100	<30	23.8	<0.2	<10	<100	<10	<10	<20
FD	Treatment	24	87.2	62.6	<50	<10	<100	<30	74.7	<0.2	<10	<100	<10	<100	<20

**Table 8**  
**Rebound Test Groundwater Results - Metals**  
**AOI 7, MHT**

Sample Type	Control or Treatment	Day	Concentrations (µg/L)												
			Antimony	Cadmium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AOI7-BH-22-001 Soil and MW-56D Groundwater															
	Control	7	43.7	<60	<50	<10	13,900	<15	3,470	<0.2	30.5	<50	<10	<50	110
FD	Control	7	<120	<60	<50	<10	18,000	<60	3,330	<0.2	23.9	<200	<10	<200	88.1
	Control	24	<60	<30	<50	<10	26,000	30.3	6,090	<0.2	43.0	<100	<10	<100	181
FD	Control	24	<60	<30	<50	<10	12,000	<30	3,220	<0.2	29.5	<100	<10	<100	<20
	Treatment	7	39.7	<3	<50	<10	205	<15	<15	3.6	<10	27.6	<10	<10	<20
FD	Treatment	7	30.4	<3	<50	<10	501	<6	<15	0.63	21.9	44.1	<10	<10	<20
	Treatment	14	36.3	<15	<50	<10	342	12.2	<15	<0.2	15.8	21.3	<10	17.1	23.3
FD	Treatment	14	23.0	<15	<50	<10	224	8.9	<15	<0.2	<10	16.5	<10	15.5	<20
	Treatment	24	<60	<30	<50	<10	154	4.2	<15	<0.2	<10	<10	<10	<10	<20
FD	Treatment	24	60.6	<30	<50	<10	356	<3	<15	<0.2	<10	<10	<10	<10	<20

**Notes:**

1. Samples were collected by Sanborn Head personnel, and treated by Terra Systems lab of Claymont, Delaware. Samples were submitted to SGS North America, Inc. (SGS) of Dayton, New Jersey 7, 14, and 24 days after treatment and analyzed for metals by United States Environmental Protection Agency (USEPA) Method 6010D. A sample type of "FD" indicates a field duplicate sample.

2. "<" indicates the analyte is not detected above laboratory reporting limits.  
 "µg/L" indicates micrograms per liter.

**Table 9**  
**Rebound Test Soil Results - Metals**  
**AOI 7, MHT**

Sample Type	Control or Treatment	Day	Concentrations in mg/kg													
			Antimony	Arsenic	Cadmium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
MW-560D Soil and MW-560D Groundwater																
	Control	24	4.2	1,380	<1.6	10.9	66.9	21,800	582	539	2.3	20.0	8.8	1.5	<1.6	190
FD	Control	24	<12	2,040	<2.9	13.5	135	27,200	1,020	646	18.8 <sup>b</sup>	26.1	14.6	<2.9	<5.8	259
	Treatment	24	<2.4	1,590	<3	12.3	48.7	22,700	251	545	2.6	23.7	3.5	1.6	<1.2	242
FD	Treatment	24	<13	1,360	<3.4	14.5	56.0	30,300	385	854	3.6	27.5	<13	<3.4	<6.7	212
MW-608D and MW-606S Groundwater																
	Control	24	<3.6	79.9	1.1	15.6	123	25,500	465	114	10.5 <sup>b</sup>	13.1	34.6	1.4	<1.8	203
FD	Control	24	<9.4	144	<2.4	29.5	197	39,600	565	124	11.6 <sup>b</sup>	13.4	51.9	<2.4	<4.7	414
	Treatment	24	<9.8	111	<2.5	24.3	159	35,500	428	165	8.9 <sup>b</sup>	16.7	30.3	<2.5	<4.9	311
FD	Treatment	24	<10	143	<2.5	30.1	207	41,500	579	130	11.5 <sup>b</sup>	14.4	41.0	<2.5	<5	397
AOI7-BH-22-001 Soil and MW-56D Groundwater																
	Control	24	<12	2,620	3.4	11.8	175	26,900	1,330	304	12 <sup>b</sup>	22.6	22.9	<2.9	<5.8	356
FD	Control	24	29.1	5,460	7.5	24.2	240	33,000	3,580	243	43.8 <sup>b</sup>	23.7	65.8	3.3	<5.3	617
	Treatment	24	<10	1,430	2.6	18.1	163	31,100	801	404	14 <sup>b</sup>	18.4	29.3	<2.5	<5	409
FD	Treatment	24	<11	3,200	4.2	13.7	219	28,700	1,340	524	18 <sup>b</sup>	23.4	22.5	<2.8	<5.7	412
MW-608D Soil and MW-608D Groundwater																
	Control	24	52.7 <sup>b</sup>	10,000	<14	26.5	305	32,900	6,230	217	58.7 <sup>bc</sup>	22.2	116	5.3	<27	662
FD	Control	24	47.2 <sup>b</sup>	10,300	15.0	53.6 <sup>b</sup>	268	55,300	5,140	164	68.8 <sup>bc</sup>	21.4	187	7.9	<26	1,130
	Treatment	24	58.4 <sup>b</sup>	9,510	<14	42.4 <sup>b</sup>	327	47,800	7,490	205	55.6 <sup>bc</sup>	24.1	580	10.0	<28	1,000
FD	Treatment	24	39.6	9,590	<14	27.8	317	35,400	5,790	248	54.8 <sup>bc</sup>	22.1	113	5.3	<27	617
MW-609D Soil and MW-609D Groundwater																
	Control	24	<12	2,820	<3	13.6	187	28,700	1,470	306	12 <sup>b</sup>	21.2	25.9	<3	<6.1	366
FD	Control	24	29.2	4,660	<5.4	27.4	269	38,400	3,290	311	27.6 <sup>b</sup>	27.0	50.0	<2.7	<11	807
	Treatment	24	18.6	3,520	3.4	24.2	189	32,800	2,440	210	32.4 <sup>b</sup>	22.1	40.3	<2.7	<5.3	546
FD	Treatment	24	28.3	4,860	<5.1	31.4	267	41,800	3,580	255	24.5 <sup>b</sup>	26.5	62.9	3.1	<10	814

**Notes:**

1. Samples were collected by Sanborn Head personnel, and treated by Terra Systems lab of Claymont, Delaware. Samples were submitted to SGS North America, Inc. (SGS) of Dayton, New Jersey 24 days after treatment and analyzed for metals by United States Environmental Protection Agency (USEPA) Method 6010D. A sample type of "FD" indicates a field duplicate sample.

2. "<" indicates the analyte is not detected above laboratory reporting limits.  
"mg/kg" indicates milligrams per kilogram.





## Borings and Monitoring Wells Included in the Bench Scale Treatability Study






Evergreen, LLC  
 Marcus Hook, Pennsylvania

Drawn By: H. LaPointe  
Designed By: C. Shepsko  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: February 2023

## Notes

1. Aerial imagery provided by Google Earth Pro. (May 2016). Claymont, Delaware USA. 39° 48' 24.73"N, 75° 25' 50.50"W, Eye alt 4289 feet. [November 2020].

### Legend

-  Monitoring Well Location  
 Soil Boring Only Location  
 AOI 7 Boundary  
 SWMU 9 Boundary  
 MW-608D
- Locations included in Bench Scale Treatability Study

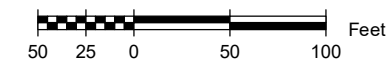






Figure 2A

## Geologic Cross Section Locations

Evergreen, LLC  
Marcus Hook, Pennsylvania

Drawn By:	H. LaPointe
Designed By:	C. Shepsko
Reviewed By:	C. Costello
Project No:	4862.00
Date:	February 2023

### Notes

1. AOI 7 well locations provided by Stanport data portal, August 2022.

2. Aerial imagery provided by Google Earth Pro.(May 2016). Claymont, Delaware USA. 39° 48' 24.73"N, 75° 25' 50.50"W, Eye alt 4289 feet.[November 2020].

3. SWMU 9 located based on SWMU 9 Data Summary Report, Wood, 2020.

### Legend

- Monitoring Well Location
- Recovery Well
- Soil Boring
- Staff Gauge
- A — A' Cross Section

100 50 0 100 200 Feet

SANBORN HEAD



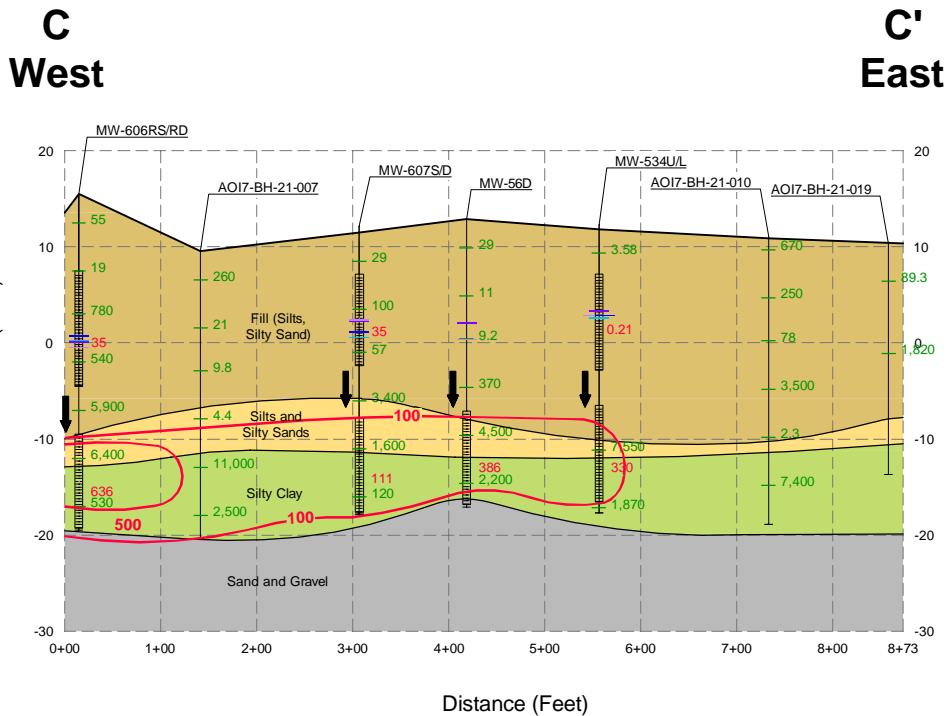
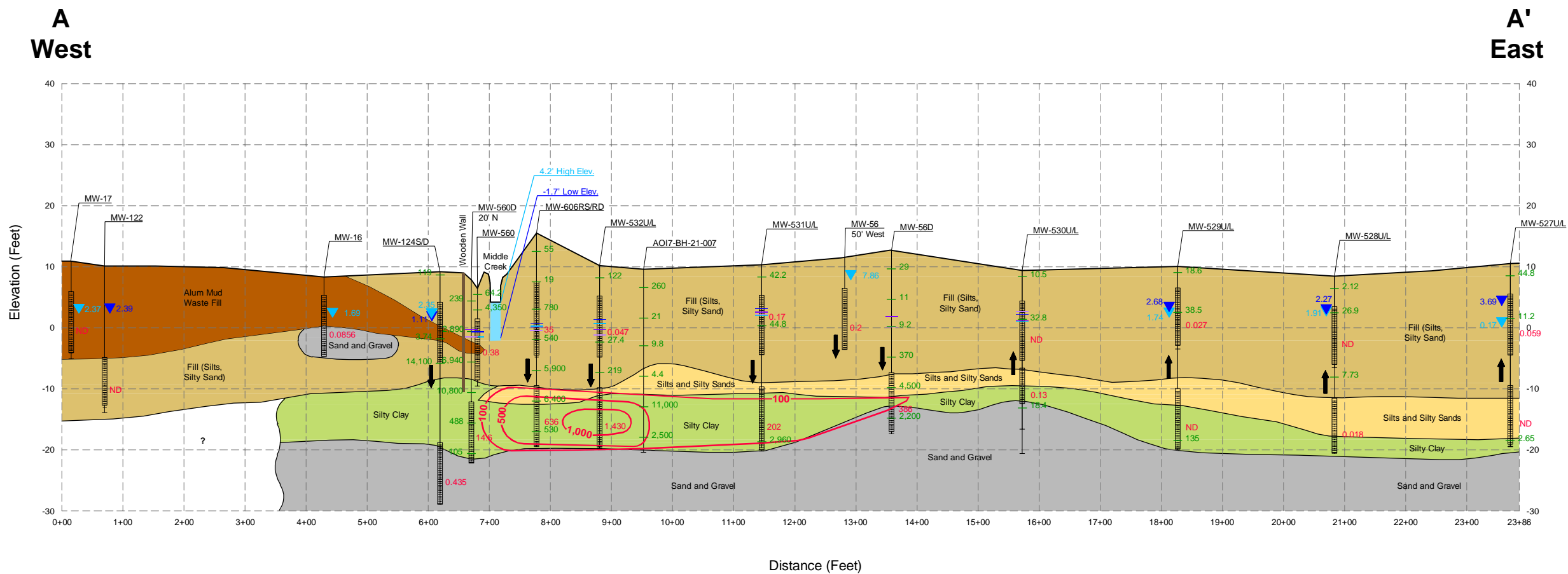


Figure 2B  
Cross Sections A-A' and  
C-C' with Arsenic  
Concentrations

Evergreen  
Marcus Hook, Pennsylvania

Drawn By: E. Wright  
Designed By: C. Shepsko  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: January 2023

### Notes

- 2021 boring logs provided in Appendix D of the 2021 IM Work Plan. RFI boring logs are in the RFI (GHD 2017, revised 2019). Logs for the 2022 borings are provided in Appendix B of this report.
- SWMU 9 topography from Supplemental Pathway Investigation Results Report (AMEC Foster Wheeler, 2017).
- Bottom elevation of Middle Creek surveyed in May 2021 by Vargo Associates using the NAVD 1988 vertical datum in US Feet.
- Groundwater elevations shown with the triangle symbology are from August 18, 2021. Updated high and low tide groundwater elevations denoted by the purple and blue lines in the legend are from September 19, 2022.
- Water elevations shown for Middle Creek were taken from the staff gauge in Middle Creek on September 19, 2022 high tide and low tide conditions.
- SWMU 9 geology based on boring logs in SWMU 9 Data Summary Report (Wood, 2020) and Cross Sections in Supplemental Pathway Investigation Results Report (AMEC Foster Wheeler, 2017).
- Soil arsenic concentrations are from the 2017 RFI (GHD, 2017), July 2021, and April/May 2022 results. Groundwater concentrations are from the August 2021 and May 2022 results.

### Legend

- MW-606RS/RD Well ID
- 55 Arsenic in soil at depth sampled (mg/kg)
- 19 Shallow high tide groundwater elevation
- 780 Shallow low tide groundwater elevation
- 35 Deep high tide groundwater elevation
- 540 Deep low tide groundwater elevation
- 1.68 Shallow groundwater elevation
- 35 Shallow Arsenic result in mg/L
- Hydraulic gradient direction
- Well screen
- 1.32 Deep groundwater elevation
- 730 Deep Arsenic result in mg/L
- 100 Arsenic isopleth mg/L

Vertical Scale  
Feet  
20'  
10'  
0  
5'  
10'

Horizontal Scale  
Feet  
100' 50' 0 100' 200'

Evergreen  
Marcus Hook, Pennsylvania

Drawn By: E. Wright  
Designed By: C. Shepsko  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: January 2023

## Notes

1. 2021 boring logs provided in Appendix D of the 2021 RI Work Plan. RFI boring logs are in the RFI (GHD 2017, revised 2019). Logs for the 2022 borings are provided in Appendix B of this report.
2. Bottom elevation of Middle Creek surveyed in May 2021 by Vargo Associates using the NAVD 1988 vertical datum in US Feet.
3. Groundwater elevations shown with the triangle symbology are from August 18, 2021. Updated high and low tide groundwater elevations denoted by the purple and blue lines in the legend are from September 19, 2022.
4. Water elevations shown for the Delaware River were taken from the USGS Station # 01482170 for the Delaware River at New Castle, DE for August 18, 2021.
5. Water elevations shown for Middle Creek were taken from the staff gauge in Middle Creek on September 19, 2022 at high tide and low tide conditions.
6. The Delaware River sediment lithology in the 0 to 5 ft below grade interval is based on sediment core logs from the January 17, 2020 Marcus Hook Industrial Complex Water Quality Certificate: January 2020 Sediment Sampling Results letter from Weston Solutions, Inc. The lithology below 5 ft below grade is projected from the lithology in AOI 7 and should be considered approximate.
7. The location of bulkhead is based on the Figure I-3 "Phillips Island Remediation System Site Plan" provided by Stantec from July 2019.
8. Soil arsenic concentrations are from the 2017 RFI (GHD, 2017), July 2021, and April/May 2022 results. Groundwater concentrations are from the August 2021 and May 2022 results.

### Legend

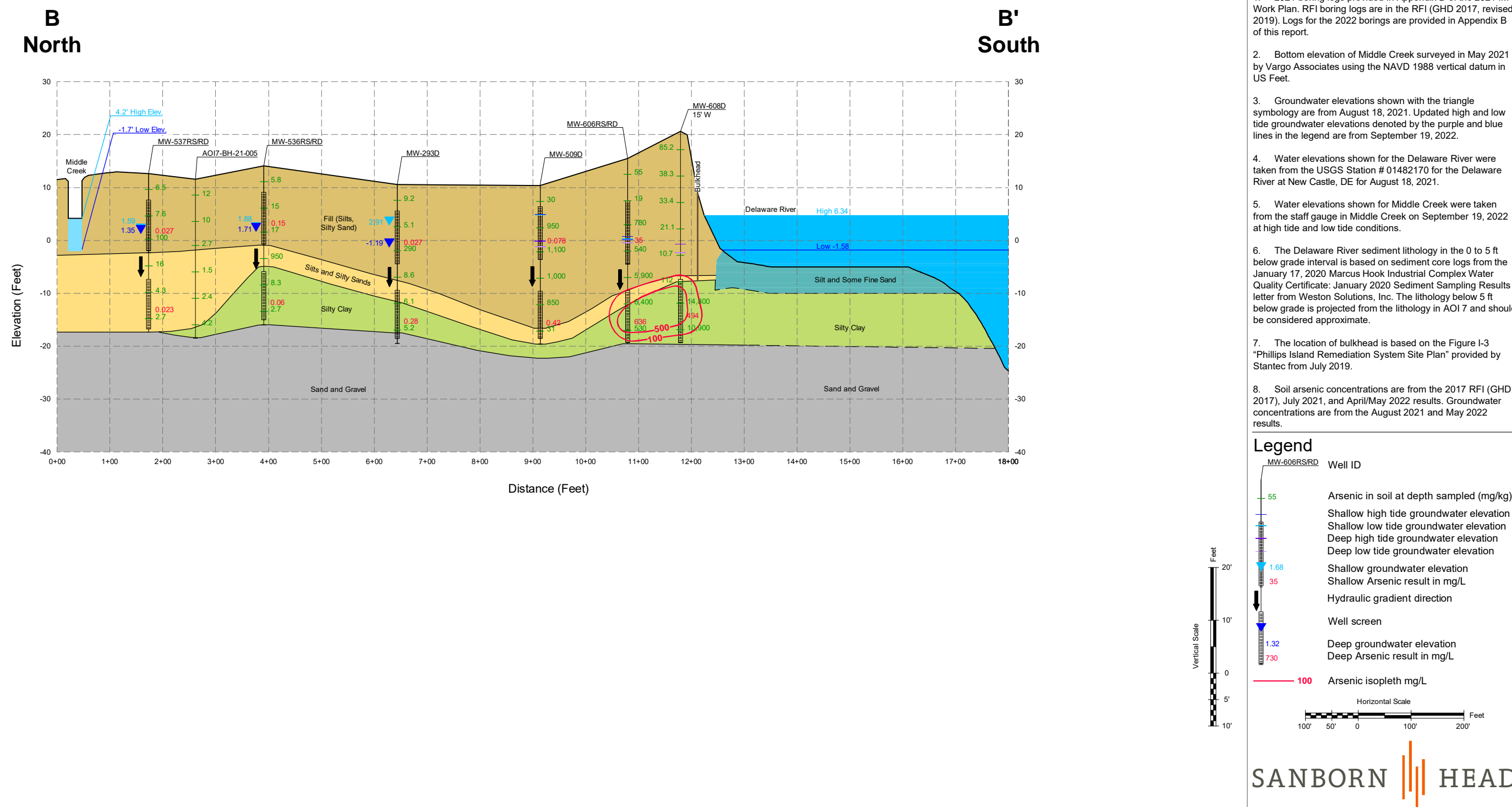






Figure 3

# Dissolved Arsenic Concentrations in Groundwater from the Bench Scale Treatability Test

Evergreen, LLC  
Marcus Hook, Pennsylvania

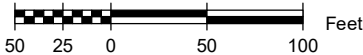
Drawn By: H. LaPointe  
Designed By: C. Shepsko  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: February 2023

## Notes

1. Aerial imagery provided by Google Earth Pro. (May 2016). Claymont, Delaware USA. 39° 48' 24.73"N, 75° 25' 50.50"W, Eye alt 4289 feet. [November 2020].
2. µg/L - micrograms per liter
3. Samples were collected between 5/24/22 and 5/26/22.
4. The groundwater preliminary remediation goal is 1,253 µg/L.

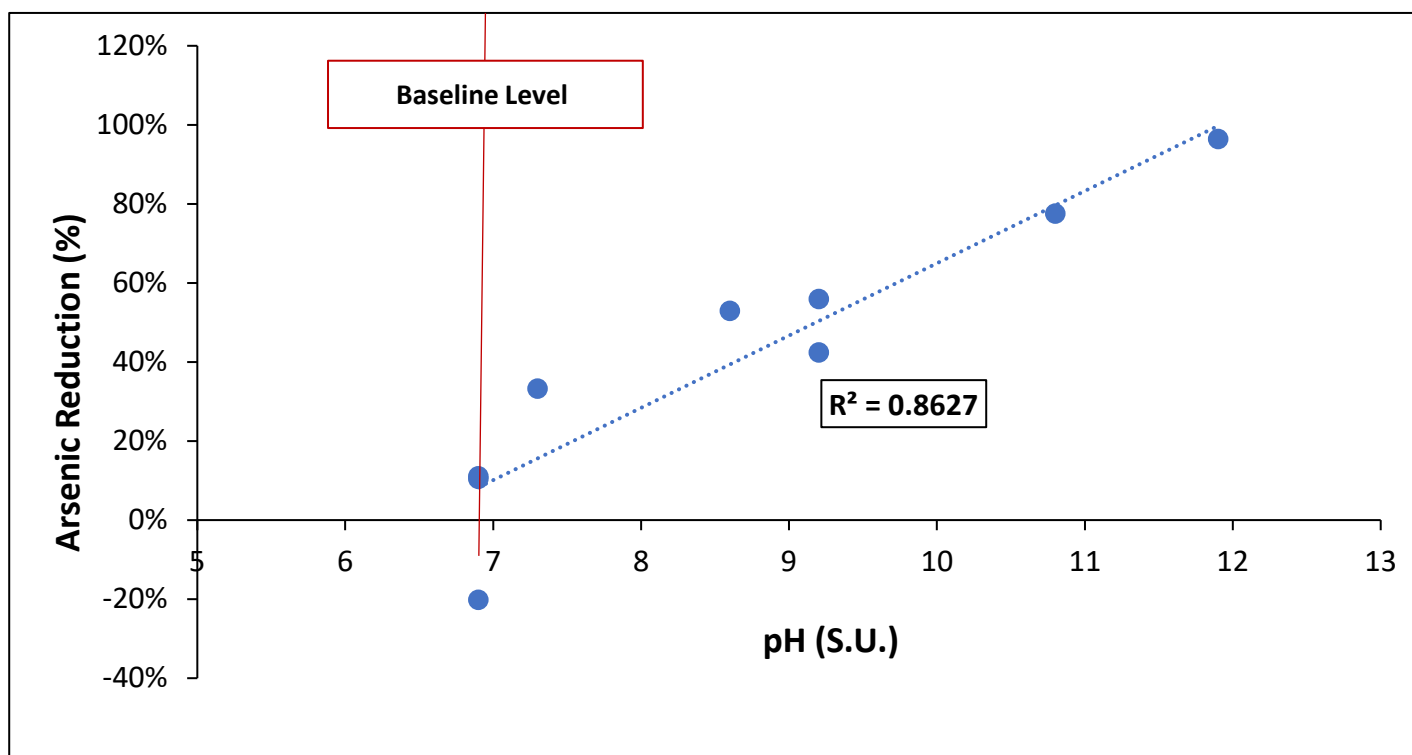
## Legend

- Monitoring Well Location
- Groundwater (µg/L)
  - Not Detected (ND)
  - <1,253
  - 1,253 - 12,530
  - 12,530 - 125,300
  - 125,300 - 1,253,000
  - >1,253,000
- AOI 7 Boundary
- SWMU 9 Boundary
- Monitoring Wells sampled for Bench Scale Treatability Study





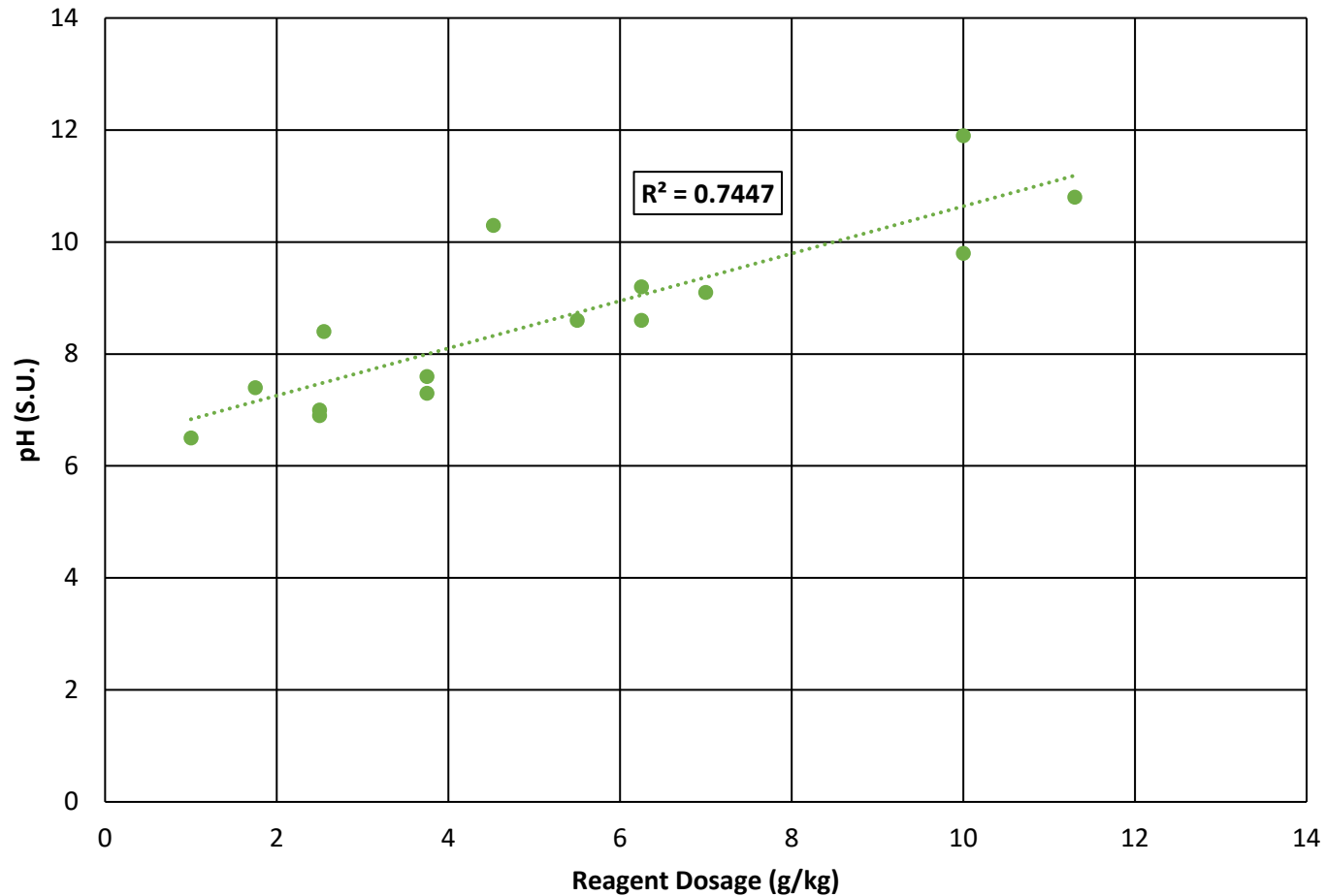
**Figure 4**  
**Arsenic Reduction from Calcium Hydroxide Treatment vs. pH during the Reagent Screening Test**  
**AOI 7, MHT**



**Notes:**

1. The data set includes treatability study samples from high soil content treatments (soil and groundwater ratio at 1:1) of three sample pairs with high arsenic initial concentrations (AOI7-BH-22-001 soil/MW-56D groundwater, MW-608D soil/MW-608D groundwater, and MW-609D soil/MW-609D groundwater) for the reagent screening test.
2. The baseline level refers to the average initial pH value between the MW-609D, MW-608D, and MW-56D samples.
3. Arsenic reduction is calculated as follows:  $(C_i - C_t)/C_i$ , where  $C_i$  is the initial arsenic concentration in the control reactor and  $C_t$  is the treated arsenic concentration during the screening test.

**Figure 5**  
**pH vs. Reagent Dosage during the Reagent Screening Test**  
**AOI 7, MHT**



**Notes:**

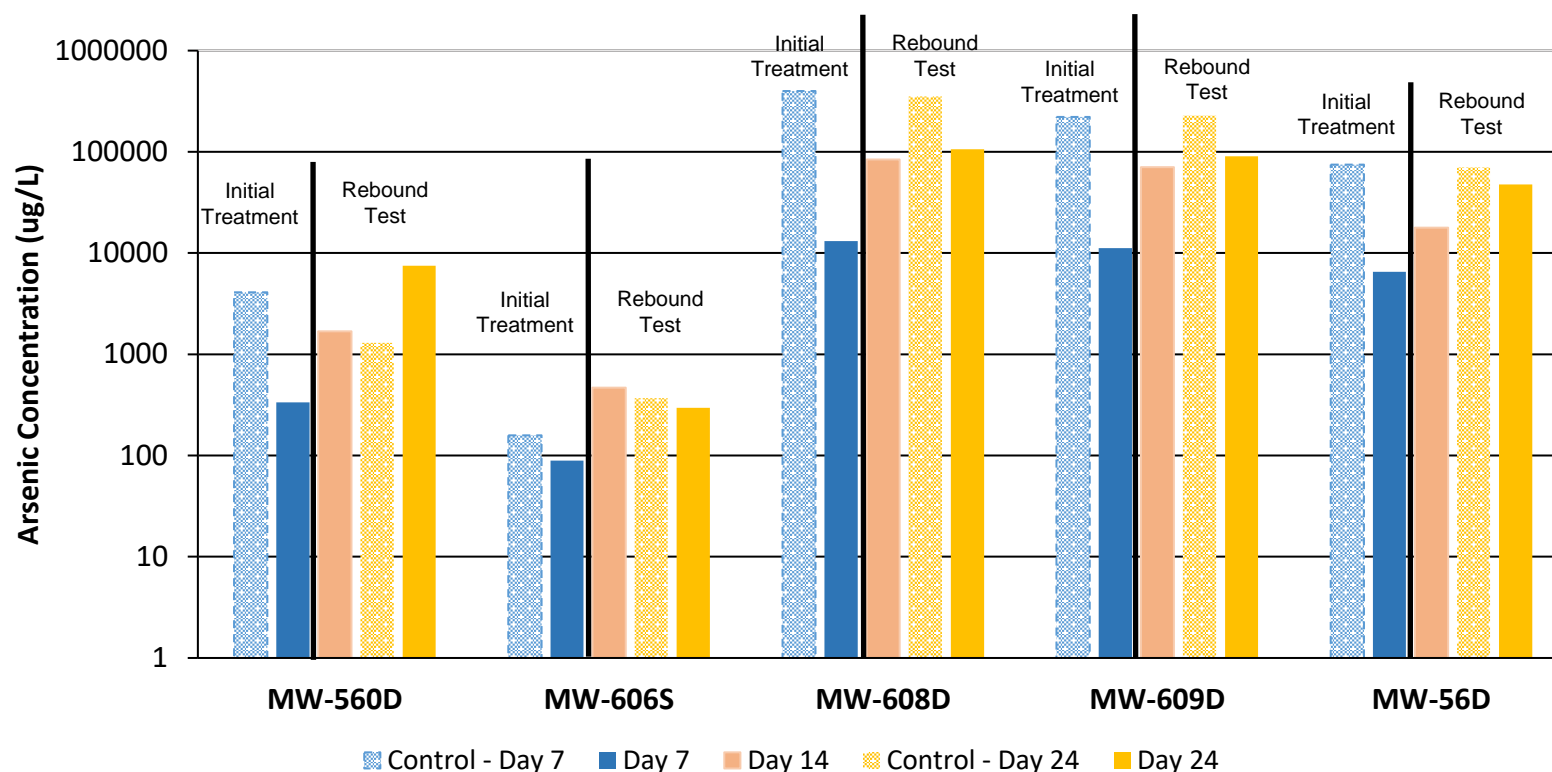
g/kg - grams of calcium hydroxide ( $\text{Ca(OH)}_2$ ) per kilogram of soil

S.U. - standard units

1. Data points are the final pH levels and  $\text{Ca(OH)}_2$  dosages in g/kg of all high soil content treatments (soil and groundwater ratio at 1:1) from the screening test.  $\text{Ca(OH)}_2$  dosages and pH levels are obtained from Table 5A and Table 5B, respectively.

2. The trend line indicates that high pH (more than 11 S.U.) can only be achieved when  $\text{Ca(OH)}_2$  dosage is above 10 g/kg. To ensure the elevated pH value is near 12 S.U., a dosage at 12.5 g/kg was recommended for the rebound test.

**Figure 6A**  
**Rebound Test Groundwater Results - Arsenic**  
**AOI 7, MHT**

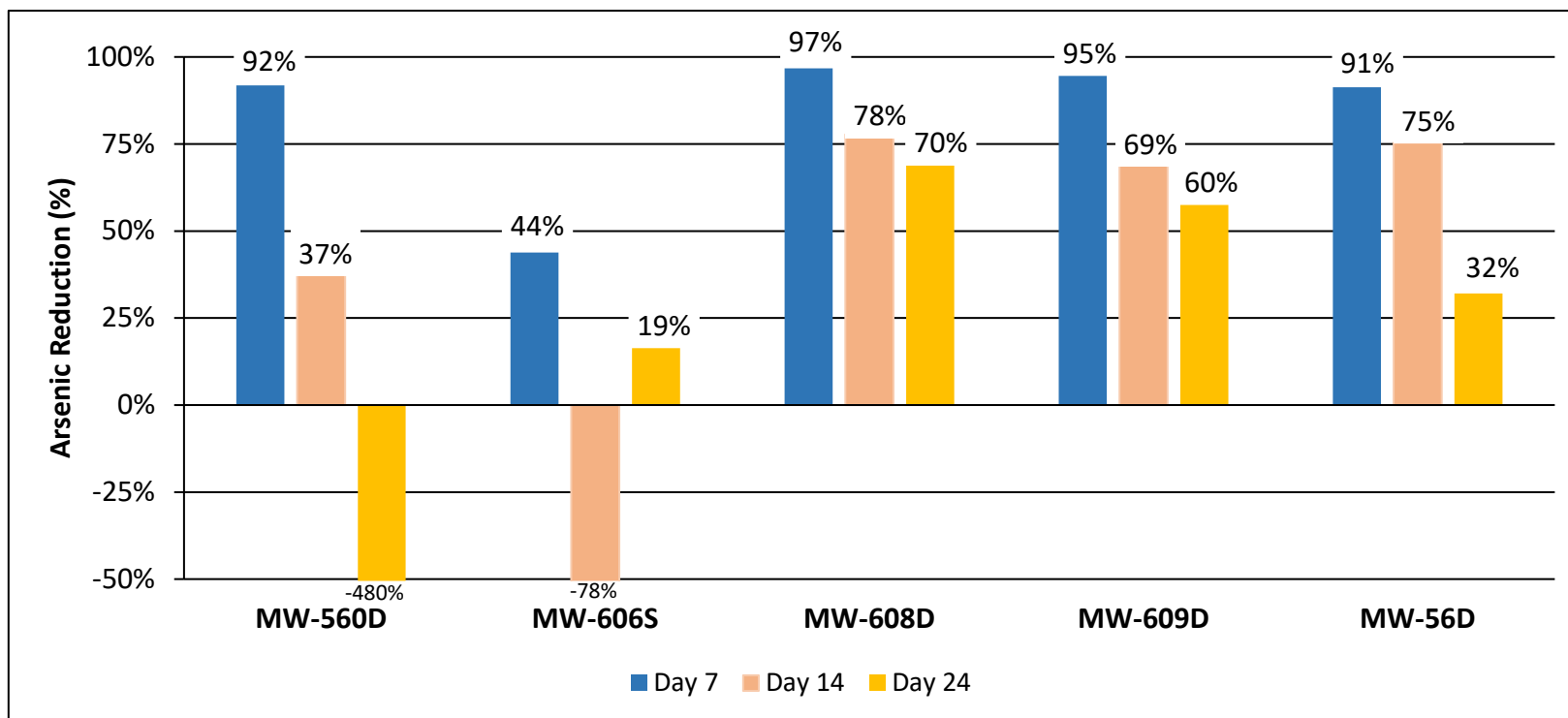


**Notes:**

ug/L - micrograms per liter

1. All arsenic concentrations are estimated from the average of the duplicated treatment or control reactors in Table 7.
2. Control - Day 7 and Control - Day 24 were set up with soil and groundwater samples without any reagent, as stated in Table 6.
3. Treatments were set up with soil and groundwater samples with 12.5 grams per kilogram (g/kg) of calcium hydroxide (Ca(OH)<sub>2</sub>).  
 On Day 7, control and treatment samples were collected for arsenic analysis and the treatment reactors were replenished with upgradient and clean groundwater.  
 On Day 14, water samples were removed from the treatment reactors for arsenic analysis and then treatment reactors were replenished with upgradient and clean groundwater.  
 On Day 24, both water and soil samples were collected from control and treatment reactors.
4. Day 7 results are evaluated to determine the initial treatment effectiveness and Day 14 and Day 24 results are evaluated to determine the potential rebound.
5. The well names on the x-axis are represented by the following soil/groundwater/replenish water pairs:  
 MW-560D: MW-560D soil/MW-560D groundwater / MW-560D replenish water  
 MW-606S: MW-608D soil/MW-606S groundwater/ MW-509 replenish water  
 MW-608D: MW-608D soil/MW-608D groundwater/MW-509D replenish water  
 MW-609D: MW-609D soil/MW-609D groundwater/MW-533L replenish water  
 MW-56D: AOI7-BH-22-001 soil/MW-56D groundwater/MW-533L replenish water

**Figure 6B**  
**Rebound Test Groundwater Results -Arsenic Reduction Graph**  
**AOI 7, MHT**



**Notes:**

- Treatments were set up with soil and groundwater samples with 12.5 grams per kilogram (g/kg) of calcium hydroxide (Ca(OH)<sub>2</sub>).  
 On Day 7, control and treatment samples were collected for arsenic analysis and the treatment reactors were replenished with upgradient and clean groundwater.  
 On Day 14, water samples were removed from the treatment reactors for arsenic analysis and then treatment reactors were replenished with upgradient and clean groundwater.  
 On Day 24, both water and soil samples were collected from control and treatment reactors.
- The well names on the x-axis are represented by the following soil/groundwater/replenish water pairs.  
 MW-560D: MW-560D soil/MW-560D groundwater / MW-560D replenish water  
 MW-606S: MW-608D soil/MW-606S groundwater/ MW-509 replenish water  
 MW-608D: MW-608D soil/MW-608D groundwater/MW-509D replenish water  
 MW-609D: MW-609D soil/MW-609D groundwater/MW-533L replenish water  
 MW-56D: AOI7-BH-22-001 soil/MW-56D groundwater/MW-533L replenish water
- Arsenic reduction is calculated as follows:  $(C_i - C_t)/C_i$ , where  $C_i$  is the initial arsenic concentration in the control reactor for that day and  $C_t$  is the treated arsenic concentration for that day. Day 14 initial arsenic concentration was calculated from the average of the Day 7 and Day 24 initial arsenic concentrations.

## **Appendix A**

### **Bench Scale Treatability Study Workplan**

# **BENCH PILOT WORKPLAN**

## **AOI 7, MARCUS HOOK INDUSTRIAL COMPLEX**

*Prepared for Evergreen Resource Management Operations  
File No. 4862.00  
Date: December 2021*

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- Figure 1A Pilot Study Injection Locations – Option 1  
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- Appendix A Reagent SDS  
Appendix B Hach Test Method Summary  
Appendix C Pilot Study Injection Form



## 1.0 INTRODUCTION

This bench-scale treatability and pilot study Workplan has been prepared on behalf of Evergreen Resource Management Operations (Evergreen) for Area of Interest (AOI) 7 (AOI 7) located within the Marcus Hook Industrial Complex (MHIC or Site). The MHIC is located in southeastern Pennsylvania and northern Delaware on the Delaware River. AOI 7 is bordered by the Middle creek and the Delaware River. The EPA has requested that the preliminary remediation goal (PRG) of 1,253 micrograms per liter ( $\mu\text{g/l}$ ) for arsenic in porewater be used as the remedial action objective for the proposed IM groundwater remedy.

Sections 1.0 through 8.0 of the IM Workplan present the background information for AOI 7 that formed the basis of this bench-scale treatability and pilot study Workplan, including the site history, summary of analytical data, arsenic fate and transport considerations, and site conceptual model. Section 9.0 in the IM Workplan presents an overview of the proposed IM approach including a description of the bench scale treatability test and pilot test, as well as discussion of project constraints and rationale for the technology selection for the IM remedy. Section 10.0 of the IM Workplan presents the proposed pre-design investigation (PDI) scope, which includes the collection of soil and groundwater data for the bench-scale treatability test and to inform the design of the pilot test. Section 11.0 includes a detailed schedule for implementation of proposed IM activities. Since this information is included in the IM Workplan, it is not repeated in this bench-scale treatability study and pilot study Workplan.

## 2.0 BENCH-SCALE STUDY SCOPE

The objective of the bench-scale study is to evaluate the appropriate in situ remediation technology for arsenic, more specifically:

- Identify the feasibility of in-situ remediation.
- Select the optimal in-situ remediation technology.
- Determine the design parameters including reagent dosage and demand.

The bench-scale treatability study will investigate five reagents, calcium polysulfide ( $\text{CaS}_x$ ), hydrated lime (calcium hydroxide,  $\text{Ca}(\text{OH})_2$ ), iron sulfide ( $\text{FeS}$ ), potassium permanganate ( $\text{KMnO}_4$ ), and ion exchange (IX) resin. The bench-scale study will be completed in two phases: an initial reagent screening test and a rebound test. The initial reagent screening will select the reagent showing the best treatment results. The selected reagent will be further tested during the rebound test to determine the long-term effectiveness of the treatment. The re-bound test will be set up to simulate what will happen if the initial mass of arsenic is remediated, to determine if any of the arsenic will remobilize after treatment.

### 2.1 Reagent Selection

The bench-scale treatability study assumes that one of the following technologies can be used for in-site remediation of arsenic within AOI 7; sulfide precipitation, high pH precipitation, chemical oxidation, and direct sorption. The reagents proposed for the bench-

scale study potentially can achieve remediation through these technologies under the conditions in AOI 7. The reagent specifications and safety data sheets (SDS) are enclosed in Appendix A. All reagents used for the bench-scale test will be the same or similar products with the same grade as what are enclosed in Appendix A. Geochemist's Workbench®, which is developed by the University of Illinois at Urbana-Champaign, was used to pre-screen the test reagents. However, the reagent usages and their dosages could be adjusted according to the results of the PDI activities and observations during the execution of the bench-scale treatability study. The following provides more detail on each of the reagents proposed for the bench-scale treatability testing:

- **Calcium Polysulfide:** This reagent is the most widely used product to provide sulfide for various metal remediations. Calcium polysulfide can provide sulfide and also increase the pH. Sulfide and higher pH levels are both beneficial for arsenic precipitation. The test dosages for the bench-scale study will be determined by sulfide stoichiometric demand, which is determined by the reactive constituents including arsenic and iron in the groundwater. The testing dosages will be assumed to be one time (X), 2X, and 3X of the stoichiometric demand. If the initial dosages cannot achieve the desired treatment results (such as incomplete precipitation), higher dosages and/or pH adjustment could be tested. The dosage that can achieve the optimal results will be further tested during the rebound test.
- **Calcium Hydroxide:** This reagent is also widely used for pH adjustment for site remediation. Calcium hydroxide application can increase pH to form various calcium arsenate complexes. Further, if the elevated soluble iron level is present, the pH increase can form iron oxide and iron hydroxide, which can sorb arsenate or form iron arsenate. A titration test using calcium hydroxide will determine its dosage to increase the pH of the groundwater and soil. The calcium hydroxide dosages will be the amounts to increase the groundwater and soil slurry to pH of 8, 10, and 12.
- **Potassium Permanganate:** This reagent is widely used for oxidation for in-situ remediation. Permanganate can generate oxidative conditions to convert arsenite to arsenate. Further, manganese dioxide can be generated after permanganate oxidation, and is known to sorb arsenic. The initial dosage will be determined via a soil oxidant demand (SOD) test. SOD measures total oxidant consumption by natural soil constituents and contaminants. The permanganate dosages during the initial test will be 0.5X, 1X and 1.5X SOD.
- **Iron Sulfide:** This product is considered an innovative product for site remediation. Iron sulfide can enhance precipitate arsenic by forming arsenic sulfide and can sorb arsenic. A commercially available product of iron sulfide is Ferro Black from Redox Solution Inc, in Carmel, IN. Ferro Black will be applied according to the manufacturer's suggestion.
- **Ion Exchange Resin:** IX resin is most commonly used for above-ground water treatment, such as pump and treat systems. It is not commonly used for in-situ remediation. IX is considered for the bench-scale testing because it can sorb arsenic

under all conditions and does not generate any adverse impacts. HIX-Nano100, an IX resin from WIST Water Solutions Pvt. Ltd., in Kolkata, West Bengal, India will be used for the bench-scale testing. This resin is a hybrid anion exchange resin doped with a mixture of hydrated iron and zirconium oxide nanoparticles irreversibly bound inside resin beads. HIX-Nano100+ resin is suitable for selective removal of dissolved arsenic (both arsenate and arsenite). The IX resin dosages rate will be based on the arsenic loading rate, which is affected by the arsenic sorption capacity and other competing anions including phosphate and sulfate. The dosages will be applied at 1X, 2X, and 3X the resin loading rate.

## **2.2 Bench-scale Bulk Soil and Groundwater Collection**

Soil samples for the bench-scale treatability study will be collected concurrently with the PDI events. The soil sampling locations are depicted in Figure 33 and Table 14 of the IM Workplan. Five different soil samples will be collected from four locations (Table 1). The target soil sample depth is selected with a preference for the most elevated arsenic soil and groundwater concentrations. Specifically, the rationales for each paired groundwater and soil sampling location are presented herein the following section.

### **2.2.1 Soil Sampling**

A soil sample will be collected from the deep aquifer during the installation of MW-560D and two soil samples will be collected from the shallow and deep aquifer during the installation of MW-608D. This area is assumed to be impacted by SWMU 9 waste and elevated sulfate and iron levels are expected to be present. Therefore, the collection of samples from this area for the bench scale testing will assist in the evaluation of the potential impact from SWMU 9 on treatment effectiveness. Further, this is the proposed location of Pilot Test Area 1 and testing of this sample will provide the design basis for the pilot study.

A soil sample will be collected from the location proposed for MW-609D, adjacent to MW-332L and near the riverbank of the Delaware River. MW-332L showed the highest arsenic concentration in groundwater in AOI 7. Testing of this sample will identify the treatment technology that can best reduce high arsenic concentrations. Further, Pilot Test Area 2 is proposed at this location. Testing of this sample will provide a design basis for the pilot study.

A soil sample will be collected near MW-534L. The area is the most distant area from SMWU9 to be included in the treatability study. This area has arsenic concentrations above the arsenic porewater PRG and geochemical conditions near MW-534L are significantly different than those near MW-560 and MW-606S/D due to the presence of LNAPL. Testing of this sample will identify the NAPL impact on treatment effectiveness.

One (1) gallon of soil will be collected for each sample and should be stored in plastic containers without headspace. The soil sample containers will be stored on ice and delivered to the treatability study facility according to the standard chain of custody.

### **2.2.2 Groundwater Sampling**

Groundwater for the treatability test will be collected from nine wells, among which five wells (MW-560D, MW-606S, MW-608D, MW-609D, and MW-534L) will be for both screening and rebound tests, and four wells (MW-560, MW-509S, MW-509D, and MW-533L) will be just for rebound test, as detailed in Table 1. Elevated arsenic concentrations that are detected in the MW-560D, MW-606S, MW-608D, MW-609D, and MW-534L wells will be used for both the screening and rebound tests while arsenic concentrations that were not detected or were detected below the arsenic porewater PRG previously in MW-560, MW-509, MW-509D, and MW-533L will have groundwater collected for use in only the rebound test. The wells selected for the rebound only test were selected since they showed similar geochemical conditions to the corresponding wells with elevated arsenic concentrations (Table 1). The groundwater samples will be collected within one week before the start of the treatability study. Five (5) liters of groundwater will be collected from each of the five contaminated wells. Two (2) liters of groundwater will be collected from each of the four clean wells. All groundwater samples will be stored in 5-liter and air-tight sampling containers without any headspace.

### **2.3 Baseline characterization**

At the beginning of the bench-scale treatability test, the baseline characterization will be performed to verify contaminant concentrations in the samples. The baseline characterization will also provide the basis for initial dosage ranges for both calcium polysulfide and IX resin. The soil and groundwater samples will be homogenized to the extent possible. The groundwater will be homogenized by agitating the groundwater collection bags. The homogenized groundwater samples will be analyzed for arsenic, iron, manganese, sulfide, sulfate, phosphate, pH, and ORP. Soil homogenization will be performed in the chemical hood using a soil mixer. The homogenized soil will be repacked into the sample containers without any headspace. Arsenic, chemical oxygen demand (COD), biochemical oxygen demand (BOD), and total organic content (TOC) will be analyzed for each homogenized soil sample. The analytical soil and groundwater samples will be sent to a certified analytical laboratory. If the arsenic concentration in any of the five groundwater samples (MW-534L, MW-560D, MW-606S, MW-608D, MW-609D) is less than the PRG, the sample (groundwater and soil from the same location) will not be further tested. For example, if the groundwater sample from MW-560D shows arsenic concentration less than PRG, the sample consisting of groundwater from MW-560D and soil samples from the deep intervals of the MW-560D boring will be excluded from the whole test scope.

The baseline soil characterization will also determine whether the permanganate oxidation test will be conducted. Elevated soil COD, BOD, and TOC levels indicate the high content of reductive constituents, which can tend to reverse the oxidative conditions back to reductive conditions. Therefore, the permanganate test will not be conducted if the elevated BOD, COD, and/or TOC are observed.

### **2.4 Titration and Soil Oxidant Demand Test**

Alkaline titration and SOD test will be conducted to determine the calcium hydroxide and potassium permanganate testing dosages.

### Titration

An alkaline titration test will be completed to determine the calcium hydroxide reagent dosages required to increase the groundwater and soil slurry pH to 8, 10, and 12.

### SOD Test

Based on the stoichiometric conversion, potassium permanganate will be amended at approximately 15 times the BOD or COD value, whichever is higher. The SOD reactors will be prepared with groundwater and soil slurry in 250-millimeter (ml) plastic containers. For each location that will be tested for oxidation, 100 grams of soil sample and 100 ml of groundwater samples will be added into the containers along with potassium permanganate powder or solution.

The SOD reactors will be incubated at room temperature on a shaker at 35 revolutions per minute (rpm). Geochemical parameters (pH and ORP) and residual permanganate will be measured on day 3 (3 days after the reactor setup). The permanganate consumption can be estimated from the difference between initial and residual permanganate concentrations.

## **2.5 Reagent Screening**

The purpose of this step is to select the most appropriate reagent for each of the five soil and groundwater samples listed in Table 1.

### **2.5.1 Test Setup**

Two different ratios of groundwater and soil will be used to set up the screening test (Table 2). The higher ratio of groundwater (3) and soil (1) will investigate groundwater arsenic impact. The lower ratio of groundwater (0.8) and soil (1) will be more representative of the actual subsurface conditions and investigate the interaction between soil and groundwater. The ratio and volume/mass could be adjusted to obtain sufficient water for analysis, based on the observation during the test. Calcium hydroxide, calcium polysulfide solution, permanganate, FerroBlack -FS27 and HIX-Nano100+ will be added in 50-millimeter (ml) containers containing the groundwater and soil slurries. The reagent dosages will be determined from the baseline characterization, titration test, and SOD test. For each sample, a total of 32 reactors will be set up.

- Control: 2 reactors for 2 different soil and groundwater ratios
- Calcium Hydroxide: 6 reactors for 3 dosages and 2 different soil and groundwater ratios
- Calcium Polysulfide: 6 reactors for 3 dosages and 2 different soil and groundwater ratios
- FerroBlack -FS27: 2 reactors for 1 dosage and 2 different soil and groundwater ratios
- Potassium Permanganate: 6 reactors for 3 dosages and 2 different soil and groundwater ratios
- HIX-Nano100: 6 reactors for 1 dosage and 2 different soil and groundwater ratios

All containers will be mixed and turned several times daily for three days. Groundwater samples (the supernatants in the reactors) will be analyzed for arsenic, iron, sulfide, sulfate, pH, and ORP. The water sample will be filtered using a 0.45  $\mu\text{m}$  syringe filter to analyze for arsenic and iron. Hach test kits will be used to measure arsenic, phosphate, iron, sulfide, and sulfate following EPA methods. A portable water quality meter will be used to measure pH and ORP. All testing methods are summarized in Appendix B.

### **2.5.2 Result Evaluation**

For each sample, the results will be evaluated to select the reagent with the best performance, based on the below criteria in a descending hierarchy:

- The concentrations in the treatment reactors should be less than the PRG level at 1,235  $\mu\text{g/L}$ .
- A higher concentration reduction between the control and the treatment is preferred.
- Lower dosage usage is preferred if treatments using the same reagent with different dosages show similar treatment efficiency of arsenic.
- Less significant changes of geochemical conditions including pH and ORP is preferred if the treatment using the same reagent with different dosages shows similar treatment efficiency of arsenic.

### **2.5.3 Test Modification**

If none of the reagents can achieve the PRG level, test modification will be performed. The initial test results can guide the additional modification step.

- If the results show the correlation between higher dosage and more concentration reduction, the higher dosage(s) will be tested for this reagent.
- If the pH and ORP values are within the ranges that prevent arsenic precipitate formation, pH adjustment using either alkaline reagent or acidic reagent will be applied.
- If the two highest dosages show a similar reduction or the concentrations in the treatment reactors are close to the PRG, the reaction likely reaches a steady stage at the ambient temperature. The same reactors will be placed at in an incubator at 10 centigrade to simulate the subsurface temperature, at which sorption or precipitation can be further enhanced.

The same size reactors will be set up according to the previous ratios. After three days, arsenic, iron, pH, and ORP will be measured following the same methods. The results will be evaluated according to the aforementioned criteria.

## **2.6 Rebound Test**

The rebound test is to evaluate long-term effectiveness of the selected treatment technology. The treatment can form arsenic precipitates and/or sorb arsenic. However, the subsurface conditions, especially pH and ORP can affect the dissolution of the precipitates or cause desorption. This test will investigate whether arsenic will be released from either precipitates or sorption after the conditions induced by treatment are reversed back to the



baseline conditions. The study will also investigate whether the remediation can cause any adverse impact, such as the increase of any site COC in the groundwater.

For each of the five samples, the reagent and its dosage will be selected according to the criteria defined in Section 5.5.3. The test will be set up in either 500-ml or 1-liter reactors. The soil and groundwater ratio will be approximately 1 to 1, with the flexibility to change according to the observations. All treatment and control will be set up in duplicate reactors, as detailed in Table 3. Each soil sample and its corresponding groundwater samples are also listed below:

Sample ID	Soil Boring Location	Contaminated Groundwater for Initial Setup	Background Groundwater for Replenish
1	15 to 25 ft bgs at MW560D	MW-560D	MW-560
2	10 to 25 at MW-608D	MW-606S	MW-509
3	25 to 33 ft bgs at MW-608D	MW-608D	MW-509D
4	20 to 28 ft bgs Near MW-534L	MW-534L	MW-533L
5	18 to 25 ft bgs at MW-609D	MW-609D	MW-533L

For each treatment reactor, the first round of groundwater samples will be collected one week after the initial setup. All supernatants will be collected for analysis of groundwater. After the first round of groundwater sampling, the groundwater sample that shows similar geochemical conditions but contains no arsenic will be replenished into the reactors to the same volume before sampling. The reactors filled with groundwater with concentrations below the arsenic porewater PRG will be incubated for seven days. On week 2, the second round of groundwater analysis will be conducted by removing all the supernatants in the reactors. All of the treatment reactors will then be filled with groundwater with concentrations below the arsenic porewater PRG. The reactors will be then incubated for another week. At the end of the third week, all reactors will be sacrificed to collect the final groundwater and soil samples. The schedule of the rebound is summarized below:

- Week 0: Reactor setup
- Week 1: First round groundwater sampling and groundwater replenishing
- Week 2: Second round groundwater sampling and groundwater replenishing
- Week 3: Final groundwater and soil sampling

The groundwater and soil sampling are summarized in Table 3. In addition to the parameters included in the reagent screening test, the full list of metals (lead, arsenic, cadmium, cobalt, copper, mercury, selenium, thallium, zinc, antimony, silver, nickel, iron, and manganese) analyzed during the RCRA Facility Investigation (RFI) will also be included in the groundwater and soil analyses during the rebound test, as summarized on Table 3.

## **2.7 Bench Scale Study Report and Pilot Study Design**

The bench-scale study results will be submitted to EPA in a monthly report. According to the test results, the most appropriate reagent will be identified. The results will provide the key pilot study design parameters including dosage, demand, and potential for rebound and recommendation for Pilot Test.

## **3.0 PILOT STUDY SCOPE**

Following the completion of the bench-scale study, a pilot study will proceed if the study identifies the suitable technology for field implementation. Since the EPA required in their October 28, 2021 comment letter that Evergreen propose an IM and implementation schedule to address arsenic in groundwater for the protection of porewater above the arsenic porewater PRG, a pilot test had to be designed even though the PDI and bench-scale treatability study were not yet completed. Therefore, based on the available information, the pilot study scope discussed below assumes the injection of calcium polysulfide solutions into the pilot areas. The rationale for selecting calcium polysulfide for the pilot study design is discussed in Section 9.0 of the revised IM Workplan. The selection of the reagent may change however based on the PDI or bench scale treatability study. The pilot study objective, design, implementation, and monitoring are discussed below.

### **3.1 Objectives**

The pilot study will provide the design basis for full-scale remediation. The objectives of the pilot study are specified as below:

- Determine the short-term and long-term effectiveness of in-situ treatment.
- Identify the groundwater remediation impact on porewater concentration.
- Identify the upgradient arsenic impact on the remediation area.
- Identify the potential for rebound due to the impact originating from SWMU 9 at the DVW site.
- Determine the delivery method effectiveness and other full-scale design parameters including radius of influence (ROI).

### **3.2 Pilot Study Design**

The pilot study design entails location selection, zone of discharge estimate, dosage estimate, and injection volume estimate. Although calcium polysulfide shows a high potential to effectively treat arsenic, site conditions, as specified in Section 9.0 of the revised IM Workplan, renders the need for a thorough bench-scale treatability study. If the bench-scale study shows the ineffectiveness of calcium polysulfide treatment, an alternative reagent and its associated delivery method will be provided in the pilot study Workplan addendum.

#### **3.2.1 Pilot Study Location**

The proposed IM approach includes two potential options for the pilot test areas, as shown on Figure 1A and Figure 1B. The final selection for the Pilot Test area and design will be based on the results of two newly proposed deep wells (MW-560D and MW-559D) obtained during the PDI (Figure 34 of the revised IM Workplan).



### Option 1

If arsenic is detected at elevated concentrations in MW-560D and/or MW-559D, Option 1 for pilot study area will be applied. As shown on Figure 1A, Pilot Test Area 1 under Option 1 is located along the boundary with SWMU 9. This area was selected to determine the effectiveness of treatment in this location and to determine if impacts from SWMU 9 groundwater would cause a re-contamination of groundwater after initial treatment. Two deep groundwater wells are proposed along this boundary, as part of the PDI included in Section 10.0 of the IM Workplan. Pilot Area 2 under Option 1 shown on Figure 34 was selected due to arsenic concentrations in soil and groundwater and proximity to Delaware River.

### Option 2

If arsenic is not detected at elevated concentrations in MW-560D and/or MW-559D, Option 2 for the pilot study area will be selected for the IM. This area would be selected in this case to determine the effectiveness of treatment in the high arsenic in deeper groundwater area in the southwest corner of AO17. As shown in Figure 1B, pilot testing will not be completed along the boundary with SWMU 9, and the proposed area adjacent to the Delaware River will be expanded from the area shown in Figure 1A.

### **3.2.2 Zone of Discharge Estimate**

The zone of discharge is defined as the groundwater that can be impacted by the remediation. The zone of discharge encloses the area that will be directly impacted during the injection (Figure 1) and the downgradient area that will be influenced during the post-remediation period. The zone of discharge volume estimate is the basis for reagent demand estimate. The key assumptions for the zone of discharge estimates are based on available information (Table 4). The groundwater velocity will determine the influence area after the remediation. Since the groundwater velocity will be further measured during the PDI event, the zone of discharge can be adjusted upon the completion of the PDI. A range of the groundwater velocity between 0.003 feet per day (ft/day) and 0.15 ft/day is used to generate the potential range of the zone of discharge. 0.003 ft/day is based on the measured hydraulic conductivity and hydraulic gradient. The upper range at 0.15 ft/day is significantly higher than the upper range of measured groundwater velocity at 0.03 ft/day. However, the higher value is applied to ensure a conservative design.

### **3.2.3 Dosage Estimate**

The reagent dosage will be based on the bench-scale study results. The dosage level that shows optimal results without adverse impact will be selected as the field implementation dosage. For the pilot study Workplan, the assumptive dosage is assumed to the stoichiometric demand with a safety factor, based on the groundwater geochemical conditions. The stoichiometric demand is based on the relations that one mole of iron can precipitate with one mole of sulfide and two moles of arsenite can precipitate with three moles of sulfide. A safety factor of 2 or 3 is applied to the stoichiometric demand to get the pilot study dosage and total demand, as summarized in Table 5. Meanwhile, due to the variations in the groundwater iron and arsenic concentrations, a range of iron or arsenic concentrations according to the results from the nearby monitoring wells is applied to the

dosage estimate. The ranges for the reagent dosages and demands are summarized in Table 6.

### **3.2.4 Injection Volume Estimate**

The total injection volume and injection volumes for each location are estimated in Table 6. The injection volume is anticipated to reach 10% of the pore volume within the area encompassed by the injection ROI. The low ratio injection volume and pore volume will minimize plume displacement and avoid surfacing.

### **3.2.5 Injection Method**

The common reagent delivery methods for in-situ remediation include injection, trenching, and soil mixing. Due to site constraints (rail, adjacent surface water bodies) and the fact that trenching and soil mixing can generate very high site disturbance and potentially damage the rail, these methods are not proposed for the pilot test. Injection is the most common method for in-situ remediation because of its lower impact and disturbance. The injection method involving hydraulic or pneumatic fracturing can distribute reagents in any formation (including silty clay) but is not proposed for the pilot test because of the close vicinity of the pilot area to the rail track. Between the two conventional injection methods via wells and direct push technology (DPT), DPT is selected for the pilot study. Compared with well injection, DPT injections have more flexibility to target discrete intervals and injectable areas. Considering the highly heterogeneous formation in the subsurface, the flexibility can increase the chances of success.

## **3.3 Pilot Study Implementation**

The implementation process will consist of the permit application, site preparation, injections, monitoring, and reporting.

### **3.3.1 Permitting**

An underground injection control (UIC) permit will be submitted to DNREC before the implementation of the remediation along with the approval from EPA. As per the requirements of the permit, the permit will outline the injection program (injection locations, existing water quality, injection media composition, volumes, mixing and injection method, injection, and performance monitoring, etc.).

### **3.3.2 Injection Preparation**

Preparation will include reagent procurement, site clearing, site survey, and delivery to the site.

- Procurement for Reagent: Section 9.0 of the revised IM Workplan explains the selection of calcium polysulfide as the injection reagent. It is anticipated that commercially available calcium polysulfide (approximately 29% solution) will be used for pilot test.
- Site Preparation: The site will be cleared to allow DPT rig access and injection staging. All injection locations will be surveyed to avoid potential subsurface utilities or

unknown obstructions. The injection locations may be adjusted according to field conditions including the lithology observed and evidence of impacts.

### **3.3.3 Injection Activity**

Injection entails reagent mixing and injecting the solution into the subsurface. The injection will follow the procedures depicted in a Process Flow Diagram in Figure 2.

#### Reagent Mixing

The reagent mixing ratios for the injection solution are detailed in Table 6. The injection solution will consist of calcium polysulfide and dilution water from a potable water source. Calcium polysulfide will be added to the mixing tanks, in which paddle mixers will be used to homogenize the reagent and water. DO and pH of the injection solution will be measured before injection.

#### Injection

The injection solution will be delivered into the subsurface via DPT injection. At each location, the DPT injection will be completed in 1-foot intervals and will be started at the bottom of the target depth. Within the target interval, the silty clay is beneath the more permeable silty sand. Because injection should initiate at the less permeable zone, the bottom-up injection will be considered. The injection will be started with low pressure and flow. The pressure will be gradually increased to achieve flow above 1 gallon per minute (gpm), without allowing surfacing of reagent mixture, if possible. If the flow is below 0.5 gpm and injection pressure is elevated, the DPT rig will be pulled up to re-initiate injection at the higher interval. Pulsed pressure injections that generate oscillation movement may be used to increase the injection flow rates in low-permeability zones. Therefore, a diaphragm pump will be used to provide the oscillation movement. Upon completion of the desired volume, each injection location DPT injection will be abandoned by filling the borehole with grout.

The post-remedial activities will entail site restoration. The site will be restored to pre-injection conditions. All equipment and reagents will be removed from the Site upon the completion of the injection. Any drummed waste will be also properly disposed accordingly.

### **3.3.4 Injection Monitoring**

Injection monitoring will consist of injection point monitoring, system monitoring, groundwater monitoring, and surface water monitoring. A summary of the monitoring locations and injection monitoring parameters is provided in Table 7. Appendix C encloses the forms to record the injection monitoring activities. At each injection location, the injection pressure and flow will be monitored and recorded. The mixing and batching record will be also summarized in the form. Monitoring of conductivity, depth to water, and sulfide concentrations will be performed to verify sulfide distribution and to determine the ROI of injection. Areas around the injection area will be observed to identify any surface daylighting. If daylighting occurs, either lower pressure will be applied to the location, or the injection will be abandoned at the location and will be moved to an adjacent location.

Because the injection of sulfide solution will not generate dust and particulate in the air, perimeter air monitoring is not required, and an air monitoring plan is not applicable.

### **3.4 Pilot Study Monitoring**

The data collected during the PDI will be used for the baseline monitoring for the pilot. Baseline sampling will be used to establish groundwater conditions before the pilot injection initiation (Table 8). Porewater monitoring may be included to establish the baseline condition because the site remediation goal is to reduce the porewater concentration to below the porewater PRG. However, the porewater sampling method should consider the procedure with minimal disturbance to avoid altering the geochemical conditions of the sediment and porewater.

Performance monitoring will be used to determine the effectiveness of arsenic treatment and the potential decrease of arsenic concentration in the porewater. The performance monitoring will consist of four quarterly post-injection sampling events, as summarized in Table 8. Groundwater parameters that will be measured during groundwater sampling include field parameters (DO, ORP, conductivity, pH, temperature, turbidity, and salinity). In addition, samples will be collected for laboratory analysis of total and dissolved metals (arsenic, lead, cadmium, cobalt, copper, mercury, selenium, thallium, antimony, silver, nickel, zinc, iron, and manganese), anions (sulfate, phosphate, and sulfide), cations (magnesium and calcium), total dissolved solids, alkalinity, and TOC.

### **3.5 Pilot Study Reporting**

Post-remediation groundwater monitoring will be completed to demonstrate the remedial effectiveness which will be documented in a Pilot Study Report which will be submitted with a monthly report to the EPA. The report will include the following items:

- A summary of the remedial activities and post-remediation groundwater monitoring results.
- Tables and figures containing pre- and post-remedial data, as appropriate.
- A description of the injection activities.
- Documentation that the in-situ treatment can achieve the porewater concentration reduction.
- Delivery method for full-scale remediation.
- Full-scale design parameters including ROI, achievable injection pressure and flow if the injection is the delivery method.

## **4.0 SCHEDULE**

Figure 35 of the IM Workplan provides the project schedule details. Once approved by the EPA, the bench-scale and pilot study are expected to initiate upon the PDI soil sampling completion in February 2022. The bench-scale study is expected to occur between February and May 2022. The pilot study is expected to last between May 2022 and July 2023. The injection activities would occur in July 2022, followed by one year of performance (post-injection) monitoring. Once the performance monitoring is completed, Evergreen will complete the final remedy design for AOI 7 and submit it in a Corrective Measures Survey

(CMS) Report. Based on the schedule in Figure 35, the expected submittal date of the CSM is September 2023.

## TABLES

**Table 1**  
**Bench-Scale Sampling**  
**AOI 7, MHIC**

Sample ID	Soil Boring Location	Groundwater Source	Rebound Groundwater Source	Soil Sampling Interval ( ft bgs)	Soil Type
1	MW-560	MW-560D	MW-560	15 - 25	Silty Sand and Silty Clay
2	MW-608D	MW-606S	MW-509	10-25	Silty Sand
3	MW-608D	MW-608D	MW-509D	25-33	Silty Sand and Silty Clay
4	Near MW-534L	MW-534L	MW-533L	20-28	Silty Clay
5	MW-609D	MW-609D	MW-533L	18-25	Silty Clay

**Notes:**

1. The sampling should not penetrate the silty clay layer.
2. ft bgs - feet below ground surface

**Table 2**  
**Bench-Scale Setup for Reagent Screening**  
**AOI 7, MHIC**

Reagent	Ground Water	Soil	Reagent Dosages	Ground Water (Meter or Test Kit)					
	ml	g		pH	ORP	Arsenic	Iron	Phosphate	Sulfide
Control	45	15		√	√	√	√	√	
	32	40		√	√	√	√	√	
Calcium polysulfide solution CaSx	45	15	1X (Stoichiometric)	√	√	√	√		√
	32	40		√	√	√	√		√
	45	15	2X (Stoichiometric)	√	√	√	√		√
	32	40		√	√	√	√		√
	45	15	3X (Stoichiometric)	√	√	√	√		√
	32	40		√	√	√	√		√
FerroBlack -FS27	45	15	Vendor recommended dosage	√	√	√	√		√
	32	40		√	√	√	√		√
Hydrated lime	45	15	pH8	√	√	√	√		
	32	40		√	√	√	√		
	45	15	pH10	√	√	√	√		
	32	40		√	√	√	√		
	45	15	pH12	√	√	√	√		
	32	40		√	√	√	√		
Permanganate	45	15	SOD 0.5X	√	√	√			
	32	40		√	√	√			
	45	15	SOD 1X	√	√	√			
	32	40		√	√	√			
	45	15	SOD 1.5X	√	√	√			
	32	40		√	√	√			
HIX-Nano100+	45	15	1X (Loading Rate)	√	√	√	√	√	√
	30	40		√	√	√	√	√	√
	45	15	2X (Loading Rate)	√	√	√	√	√	√
	30	40		√	√	√	√	√	√
	45	15	3X (Loading Rate)	√	√	√	√	√	√
	30	40		√	√	√	√	√	√

**Notes:**

1. ml: milliliter  
g:gram  
g/L:gram per liter  
SOD: Soil oxygen demand  
ORP: Oxidation-reduction potential
2. The setup is for each sample. Five sets will be established for the five samples, as listed in Table 2.
3. The setup dosage and analytes are subject to changes according to baseline characterization and observation.



**Table 3**  
**Bench-Scale Setup for Rebound**  
**AOI 7, MHIC**

Reactor number	Treatment Reactor ID	Groundwater	Soil	Reagent	Groundwater <sup>1,2</sup>			Soil - Analytical <sup>3</sup>		
		ml	g		First	Second	Final	First	Second	Final
1	C1	350	350		√					
2	C1-DUP	350	350		√					
3	C3	350	350				√			√
4	C3-DUP	350	350				√			√
5	T3	350	350	X	√	√	√			√
6	T3-DUP	350	350	X	√	√	√			√

**Notes:**

ml - milliliter

C - Control

DUP - Duplicate

g - gram

<sup>1</sup>The groundwater will be analyzed for pH, oxidation-reduction potential (ORP), and sulfide using a Hach kit or meter.

<sup>2</sup>The analytical groundwater parameters will include dissolved metals and anions:

Metals - Arsenic, lead, cadmium, cobalt, copper, mercury, selenium, thallium, antimony, silver, nickel, zinc, iron, and manganese

Anions - Sulfate and phosphate

<sup>3</sup>The analytical soil samples will include metals:

Metals - Arsenic, lead, cadmium, cobalt, copper, mercury, selenium, thallium, antimony, silver, nickel, zinc, iron, and manganese

**Table 4**  
**Pilot Study Discharge Estimate**  
**AOI 7, MHIC**

Plume Volume During Injection		Area 1	Area 2	Area 1	Area 2
Length (Perpendicular of GW Flow) of Pilot Injection Area	feet	54	68	54	68
Width (Parallel of GW Flow) of Pilot Injection Area	feet	28	28	28	28
Target Pilot Injection Area	sq feet	1,500	1,900	1,500	1,900
Depth to Water	feet bgs	10	10	10	10
Top of the Treatment Zone	feet bgs	15	18	15	18
Bottom of the Treatment Zone	feet bgs	25	25	33	25
Treatment Thickness	feet	10	7	18	7
Treatment Volume	cu feet	15,000	13,300	27,000	13,300
Soil Wet Density	lb/cu feet	120	120	120	120
Treatment Soil Mass	lb	1,800,000	1,596,000	3,240,000	1,596,000
Soil Porosity		0.3	0.3	0.3	0.3
Plume Volume	gallons	33,700	29,900	60,600	29,900
Downgradient Area					
Length (Perpendicular of GW Flow) of Pilot Injection Area	feet	54	68	54	68
Groundwater Velocity Lower Range <sup>a</sup>	feet/day	0.003	0.003	0.003	0.003
Discharge Duration	year	1	1	1	1
Downgradient Area Lower Range	sq feet	100	100	100	100
Plume Volume Lower Range	gallons	2,300	1,600	4,100	1,600
Groundwater Velocity Upper Range <sup>b</sup>	feet/day	0.15	0.15	0.15	0.15
Discharge Duration	year	1	1	1	1
Downgradient Area Upper Range	sq feet	3,000	3,800	3,000	3,800
Plume Volume Upper Range	gallons	67,400	59,700	121,200	59,700
Total Zone of Discharge					
Lower Range <sup>a</sup>					
Discharge Area	sq feet	1,600	2,000	1,600	2,000
Discharge Volume	gallons	36,000	31,500	64,700	31,500
Total Discharge Volume	gallons	67,500		96,200	
Upper Range <sup>b</sup>					
Discharge Area	sq feet	4,500	5,700	4,500	5,700
Discharge Volume	gallons	101,100	89,600	181,800	89,600
Total Discharge Volume	gallons	190,700		271,400	

**Notes:**

sq feet - square feet

bgs - below ground surface

lb - pound

cu - cubic

lb/cu feet - pound per cubic feet

a - The low groundwater velocity is based on the field measurement of hydraulic gradient and slug test.

b - The high groundwater velocity is significantly higher than available field measurement. The level is used for a conservative estimate.

**Table 5**  
**Reagent Dosage and Demand Estimate**  
**AOI 7, MHIC**

	Unit	Option 1		Option 2	
		Area 1 <sup>3</sup>	Area 2 <sup>4</sup>	Area 1 <sup>5</sup>	Area 2 <sup>4</sup>
<b>Site Condition</b>					
Length (Perpendicular of GW Flow) of Pilot Injection Area	feet	54	68	54	68
Width (Parallel of GW Flow) of Pilot Injection Area	feet	28	28	28	28
Target Pilot Injection Area	sq feet	1,500	1,900	1,500	1,900
Top of the Treatment Zone	feet bgs	15	18	15	18
Bottom of the Treatment Zone	feet bgs	25	25	33	25
Treatment Thickness	feet	10	7	18	7
Soil Porosity		0.3	0.3	0.3	0.3
Plume Volume	gallons	33,700	29,900	60,600	29,900
<b>Dosage Estimate-Lower Range<sup>1</sup></b>					
Downgradient Plume Volume	gallons	2,300	1,600	4,100	1,600
Discharge Volume	gallons	36,000	31,500	64,700	31,500
Arsenic Concentration	mg/L	50	500	400	500
	mmol/L	1	7	5	7
Iron Concentration	mg/L	500	100	400	100
	mmol/L	9	2	7	2
Sulfide Stoichiometric Concentration	mmol/L	10	12	15	12
Safety Factor		3	2	2	2
Sulfide Dosage	mmol/L	30	24	30	24
	g/L	1.0	0.8	1.0	0.8
Calcium Polysulfide Dosage	g/L	1.2	0.9	1.2	0.9
29% Calcium Polysulfide Dosage	g/L	4	3	4	3
29% Calcium Polysulfide Demand	pounds	1,231	853	2,250	853
	pounds	2,084		3,103	

**Table 5**  
**Reagent Dosage and Demand Estimate**  
**AOI 7, MHIC**

	Unit	Option 1		Option 2	
		Area 1 <sup>3</sup>	Area 2 <sup>4</sup>	Area 1 <sup>5</sup>	Area 2 <sup>4</sup>
<b>Dosage Estimate-Upper Range<sup>2</sup></b>					
Downgradient Plume Volume	gallons	67,400	59,700	121,200	59,700
Discharge Volume	gallons	101,100	89,600	181,800	89,600
Arsenic Concentration	mg/L	100	1,500	800	1,500
	mmol/L	1	20	11	20
Iron Concentration	mg/L	500	100	400	100
	mmol/L	9	2	7	2
Sulfide Stoichiometric Concentration	mmol/L	11	32	23	32
Safety Factor		3	2	2	2
Sulfide Dosage	mmol/L	33	64	46	64
	g/L	1.0	2.0	1.5	2.0
Calcium Polysulfide Dosage	g/L	1.3	2.5	1.9	2.5
29% Calcium Polysulfide Dosage	g/L	5	9	6	9
29% Calcium Polysulfide Demand	pounds	3,807	6,541	9,664	6,541
	pounds	10,348		16,205	

**Notes:**

sq feet - square feet

bgs - below ground surface

g/L - grams per liter

cu - cubic

feet bgs - feet below ground surface

mg/L - milligram per liter

mmol/L - millimole per liter

<sup>1</sup> Lower ranges considered the lower discharge volume and lower arsenic and iron concentrations

<sup>2</sup> Upper ranges considered the higher discharge volume and higher arsenic and iron concentrations

<sup>3</sup> Arsenic concentrations were assumed values and iron concentrations are from nearby well MW-558D

<sup>4</sup> Arsenic and iron concentration were from MW-332L

<sup>5</sup> Arsenic and iron concentrations were from MW-606S and MW-606D

**Table 6**  
**Reagent Mixing and Batching Recommendation**  
**AOI 7 MHIC**

	Unit	Option 1		Option 2	
<b>Plume Volume During Injection</b>		Area 1	Area 2	Area 1	Area 2
Injection Points	DPTs	8	10	8	10
Radius of Influence (ROI)	feet	7	7	7	7
Depth to Water	feet bgs	10	10	10	10
Top of the Treatment Zone	feet bgs	15	18	15	18
Bottom of the Treatment Zone	feet bgs	25	25	33	25
Treatment Thickness	feet	10	7	18	7
Soil Porosity		0.3	0.3	0.3	0.3
Pore Volume with ROI	gallons	3,453	2,417	6,215	2,417
% Pore Volume for Injection		10%	10%	10%	10%
Injection Volume per Point	gallons	345	242	621	242
Total Injection Volume	gallons	2,762	2,417	4,972	2,417
Treatment Soil Mass	gallons	5,179		7,389	
<b>Mixing Procedure-Lower Dosage Range</b>					
29% Calcium Polysulfide Demand	pounds	1231	853	2250	853
29% Calcium Polysulfide Density	g/ml	1.3	1.3	1.3	1.3
29% Calcium Polysulfide Volume	gallons	116	80	211	80
Dilution Water Demand	gallons	2,646	2,337	4,760	2,337
<b>250-gallon Batch - Lower Dosage Range</b>					
29% Calcium Polysulfide Volume	gallons	10	8	11	8
Dilution Water Volume	gallons	240	242	239	242
<b>Mixing Procedure-Upper Dosage Range</b>					
29% Calcium Polysulfide Demand	pounds	3807	6541	9664	6541
29% Calcium Polysulfide Density	g/ml	1.3	1.3	1.3	1.3
29% Calcium Polysulfide Volume	gallons	358	615	908	615
Dilution Water Demand	gallons	2,404	1,802	4,064	1,802
<b>250-gallon Batch - Upper Dosage Range</b>					
29% Calcium Polysulfide Volume	gallons	32	64	46	64
Dilution Water Volume	gallons	218	186	204	186

**Notes:**

sq feet - square feet

bgs - below ground surface

g/ml - grams per milliliter

DPT - Direct Push Technology

**Table 7**  
**Injection Monitoring Summary**  
**AOI 7, MHIC**

Location	Matrix	Parameters	Frequency	Monitoring Instruments/Method
Monitoring Locations <sup>a</sup>	Groundwater <sup>b</sup>	Groundwater elevation	2 to 3 times daily during injection	Water level meter
		Field parameters	2 to 3 times daily during injection	Horiba U-22 or YSI meter
		Sulfide	Before injection and daily during injection	Hach meter
	Surface Water	Color and Odor	Every 30 - 60 mins	Vision
Injection System including Skid, Distribution Manifold and Injection wells Heads <sup>c</sup>	Injection Mix	Flow-rate, volume injected and injection pressure	Every 30 - 60 mins	Pressure gauges, and totalizers
Mixing	Water	Dissolved oxygen and pH	2 to 3 times daily during injection	Horiba U-22 or YSI meter

**Notes:**

1. Field parameters - dissolved oxygen, oxidation-reduction potential, conductivity, pH, temperature, turbidity, total dissolved solids and salinity.

a - Wells for injection monitoring may include MW-560S, MW-560D, MW-606S, MW-606D, MW-608D, MW-609D, MW-332U, MW-332L.

b - Groundwater samples will be retrieved with a bailer for measurement of field parameters.

c - Injection intervals will be noted.

**Table 8**  
**Pilot Test Performance Monitoring Summary**  
**AOI 7, MHIC**

Media	Well ID	Baseline and Quarterly Performance Monitoring First Year Post-Injections						
		Field Parameters	Geochemical Parameters	Anions	Total Metals	Dissolved Metals	Cations	Sulfide
Groundwater	MW-560	X		X	X	X		X
	MW-560D	X	X	X	X	X	X	X
	MW-606S	X	X	X	X	X	X	X
	MW-606D	X	X	X	X	X	X	X
	MW-608D	X	X	X	X	X	X	X
	MW-609D	X	X	X	X	X	X	X
	MW-332U	X		X	X	X		X
	MW-332L	X	X	X	X	X	X	X
Pore Water	PS-1				X	X		

**Notes:**

1. Field Parameters include dissolved oxygen, oxidation-reduction potential (ORP), conductivity, pH, temperature, and turbidity.
2. Total Metals include arsenic, lead, cadmium, cobalt, copper, mercury, selenium, thallium, antimony, silver, nickel, zinc, iron, and manganese.
3. Dissolved Metals include Arsenic, lead, cadmium, cobalt, copper, mercury, selenium, thallium, antimony, silver, nickel, zinc, iron, and manganese.
4. Anions include sulfate and phosphate.
5. Geochemical Parameters include total organic content, total dissolved solids, alkalinity.
6. Cations include calcium and magnesium.
7. If Option 1 is selected for the pilot test area selection, MW-560 and MW-560D will not be sampled.
8. If Option 2 is selected for the pilot test area selection, MW608D will not be sampled.

## FIGURES





Figure 1A

# Pilot Study Injection Locations - Option 1

Evergreen  
Marcus Hook, Pennsylvania

Drawn By: M. Forte / E. Wright  
Designed By: C. Costello  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: December 2021

## Notes

- 1. AOI 7 well locations provided by Stanport data portal, August 2021.
- 2. Aerial imagery Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
- 3. SWMU 9 located based on SWMU 9 Data Summary Report, Wood, 2020.
- 4. The bulkhead, remedial systems, sheet pile wall and well locations were provided by Stantec in Figure I-3 "Phillips Island Remediation System Site Plan" from July 2019.

## Legend

- Monitoring Well
- Recovery Well
- Remediation Well
- Soil Boring
- Staff Gauge
- Proposed Pilot Study Area
- Sunoco Pipeline
- Bulkhead
- Sheet Pile Wall
- Remediation Systems
- AOI-7 Boundary
- SWMU 9 Boundary

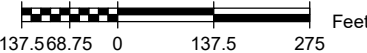






Figure 1B

## Pilot Study Injection Locations - Option 2

Evergreen  
Marcus Hook, Pennsylvania

Drawn By: M. Fuerte / E. Wright  
Designed By: C. Costello  
Reviewed By: C. Costello  
Project No: 4862.00  
Date: December 2021

## Notes













1. AOI 7 well locations provided by Stanport data portal, August 2021.

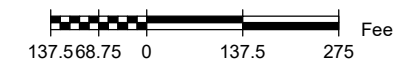
2. Aerial imagery Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

3. SWMU 9 located based on SWMU 9 Data Summary Report, Wood, 2020.

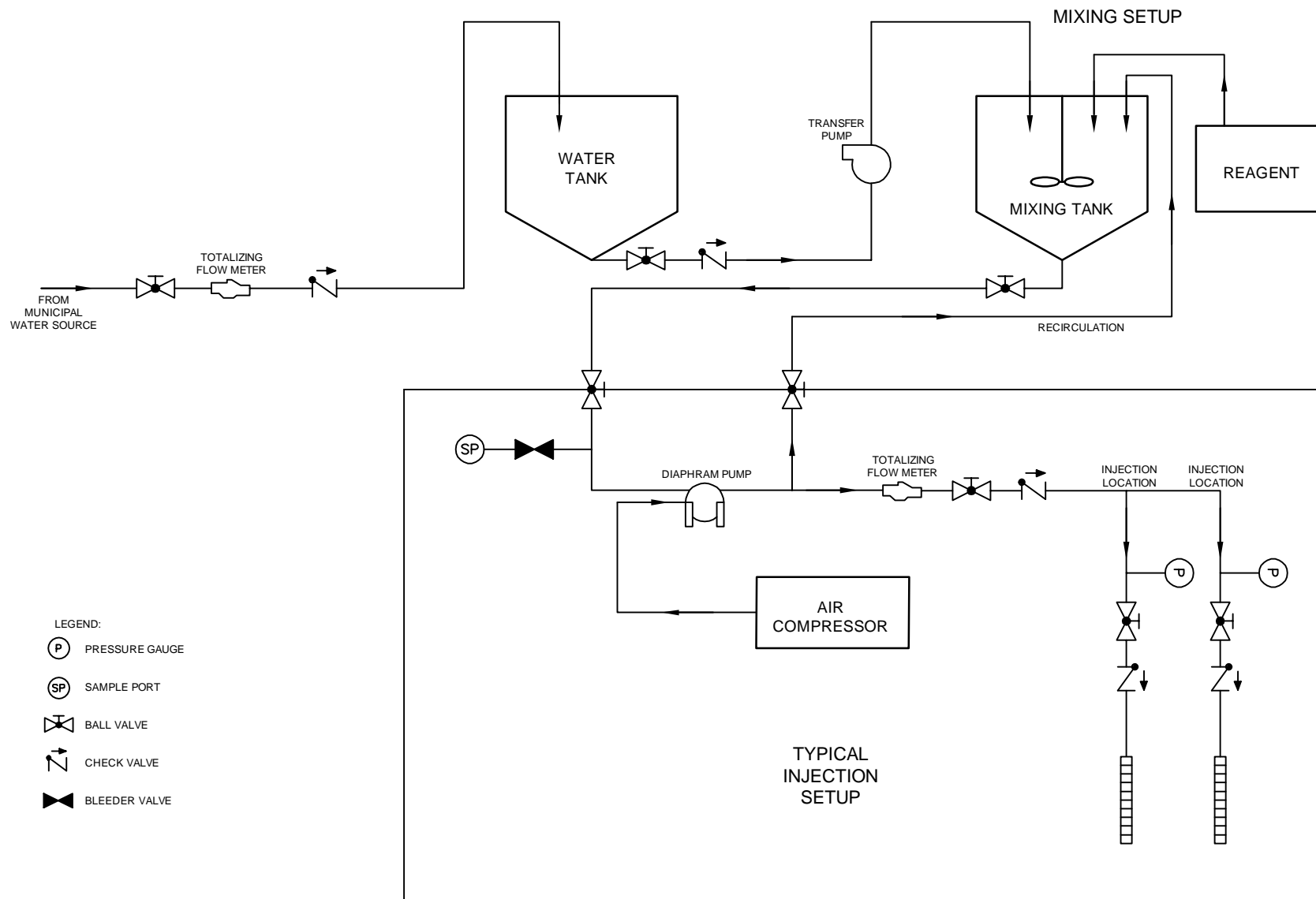
4. The bulkhead, remedial systems, sheet pile wall and well locations were provided by Stantec in Figure I-3 "Phillips Island Remediation System Site Plan" from July 2019.

### Legend

-  Monitoring Well
-  Recovery Well
-  Remediation Well
-  Soil Boring
-  Staff Gauge
-  Proposed Pilot Study Area
-  Sunoco Pipeline
-  Bulkhead
-  Sheet Pile Wall
-  Remediation Systems
-  AOI-7 Boundary
-  SWMU 9 Boundary







LEGEND:

- PRESSURE GAUGE
- SAMPLE PORT
- BALL VALVE
- CHECK VALVE
- BLEEDER VALVE

**APPENDIX K**

**BENCH SCALE TREATABILITY  
AND PILOT TEST WORKPLAN**

# **APPENDIX A**

## **REAGENT SDS**

**APPENDIX A**

**REAGENT SDS**



## Material Safety Data Sheet

### Calcium polysulfide solution

MSDS Number 6100 (Revised: 4/29/02)

6 Pages

<b>Section</b>	<b>1:</b>	<b>CHEMICAL PRODUCT and COMPANY IDENTIFICATION</b>
----------------	-----------	--

- 1.1 Product Name** ..... **Calcium polysulfide solution**  
Chemical Family ..... Inorganic salt solution  
Synonyms ..... Calcium polysulfide, CaPS, calcium sulfide, lime sulphur  
Formula .....  $\text{CaS}_x$
- 1.2 Manufacturer** ..... Tessenderlo Kerley Inc.  
2255 N. 44<sup>th</sup> Street, Suite 300  
Phoenix, Arizona 85008-3279  
Information ..... (602) 889-8300
- 1.3 Emergency Contact** ..... (800) 877-1737 (Tessenderlo Kerley)  
**(800) 424-9300 (CHEMTREC)**

<b>Section</b>	<b>2:</b>	<b>COMPOSITION, INFORMATION ON INGREDIENTS</b>
----------------	-----------	--

- 2.1 Chemical Ingredients (% by wt.)**
- |                     |                 |     |
|---------------------|-----------------|-----|
| Calcium polysulfide | CAS #:1344-81-6 | 29% |
| Water               | CAS #:7732-18-5 | 71% |

(See Section 8 for exposure guidelines)

<b>Section</b>	<b>3:</b>	<b>HAZARDS IDENTIFICATION</b>
----------------	-----------	-------------------------------

**NFPA:**      **Health - 3**      **Flammability - 0**      **Reactivity - 1**

#### EMERGENCY OVERVIEW

**Warning:**

Avoid inhalation of product fumes (hydrogen sulfide) near openings on storage container. Release of the product to the environment may cause the evolution of highly toxic hydrogen sulfide vapors. Product solution is very alkaline and corrosive to the skin. Eye contact will cause severe eye irritation and possible corneal damage. Ingestion will result in corrosion of tissues and the release of hydrogen sulfide in the gastrointestinal tract.

<b>Section</b>	<b>3:</b>	<b>HAZARDS IDENTIFICATION (Cont.)</b>
----------------	-----------	---------------------------------------

**3.1 POTENTIAL HEALTH EFFECTS**

**EYE:** Contact with the eyes by product mist or solution will cause irritation and a burning sensation. Eye contact may result in severe corneal injury.

**SKIN CONTACT:** Contact with product mist or solution will cause skin irritation and may result in corrosion of the skin.

**SKIN ABSORPTION:** Absorption is unlikely to occur.

**INGESTION:** Ingestion of product solution will cause irritation and corrosion of the gastrointestinal tract to include nausea, vomiting and diarrhea. Contact with stomach acid will cause highly toxic hydrogen sulfide to evolve.

**INHALATION:** Inhalation of product vapors (hydrogen sulfide) may cause dizziness and unconsciousness possibly resulting in serious falls from elevated positions..

**CHRONIC EFFECTS/CARCINOGENICITY:** Not listed as a carcinogen by NTP, IARC or OSHA.

<b>Section</b>	<b>4:</b>	<b>FIRST AID MEASURES</b>
----------------	-----------	---------------------------

**4.1 EYES:** Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye and lids. Obtain immediate medical attention.

**4.2 SKIN:** Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

**4.3 INGESTION:** DO NOT INDUCE VOMITING. If victim is conscious, immediately give large quantities of water. If vomiting does occur, continue to give fluids. Obtain immediate medical attention.

**4.4 INHALATION:** Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

<b>Section</b>	<b>5:</b>	<b>FIRE FIGHTING MEASURES</b>
----------------	-----------	-------------------------------

**5.1 FLAMMABLE PROPERTIES**

**FLASH POINT:** Not flammable (See Section 5.4)

**METHOD USED:** NA

**5.2 FLAMMABLE LIMITS**      **H<sub>2</sub>S**      **LFL:** 4%      **UFL:** 44%

**5.3 EXTINGUISHING MEDIA:** Water spray or foam or as appropriate for combustibles involved in fire.



<b>Section</b>	<b>5:</b>	<b>FIRE FIGHTING MEASURES (Cont.)</b>
----------------	-----------	---------------------------------------

**5.4 FIRE & EXPLOSIVE HAZARDS:** When heated or diluted, hydrogen sulfide vapors will evolve. This gas may form explosive mixtures with air. (See Section 5.2) Keep containers/storage vessels in fire area cooled with water spray.

**5.5 FIRE FIGHTING EQUIPMENT:** Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, positive pressure, (MSHA/NIOSH approved or equivalent) and full protective gear.

<b>Section</b>	<b>6:</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
----------------	-----------	------------------------------------

**6.1 Small releases:** Confine and absorb small releases on sand, earth or other inert absorbent. Released material may contain residual sulfides. Spray with weak (~5%) hydrogen peroxide to oxidize sulfides.

**6.2 Large releases:** Confine area to qualified personnel. Wear proper protective equipment. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (possible toxic or explosive mixtures) or surface waterways (potential aquatic toxicity). Spray product vapors with fine water spray or mist. Recover as much of the solution as possible. Treat remaining material as a small release (above).

<b>Section</b>	<b>7:</b>	<b>HANDLING and STORAGE</b>
----------------	-----------	-----------------------------

**7.1 Handling:** Handle in enclosed containers to avoid breathing product. Avoid contact with skin and eyes. Dilute only in enclosed containers. Use in a well ventilated area. Wash thoroughly after handling.

**7.2 Storage:** Store in well ventilated areas in enclosed containers. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote, drums and small containers out of direct sunlight at moderate temperatures [ $<90^{\circ}\text{F}$  ( $32^{\circ}\text{C}$ )]. (See Section 10.4 for materials of construction)

<b>Section</b>	<b>8:</b>	<b>EXPOSURE CONTROLS, PERSONAL PROTECTION</b>
----------------	-----------	---

**8.1 RESPIRATORY PROTECTION:** Wear self-contained breathing apparatus, positive pressure, MSHA/NIOSH (approved or equivalent).

**8.2 SKIN PROTECTION:** Gloves, boots, and chemical suit should be worn to prevent liquid contact. Wash contaminated clothing prior to reuse. Contaminated shoes cannot be cleaned and should be discarded

**8.3 EYE PROTECTION:** Chemical goggles and a full face shield.

**8.4 EXPOSURE GUIDELINES:**

	OSHA		ACGIH	
	<u>TWA</u>	<u>STEL</u>	<u>TLV</u>	<u>STEL</u>
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

**8.5 ENGINEERING CONTROLS:** Use adequate exhaust ventilation to prevent inhalation of product vapors. Maintain eyewash/safety shower in areas where chemical is handled.

<b>Section</b>	<b>9:</b>	<b>PHYSICAL and CHEMICAL PROPERTIES</b>
----------------	-----------	---

<b>9.1 APPEARANCE:</b>	Deep-red-orangish brown liquid
<b>9.2 ODOR:</b>	Strong order of rotten eggs
<b>9.3 BOILING POINT:</b>	Not determined
<b>9.4 VAPOR PRESSURE:</b>	Not determined (Believed to be minimal)
<b>9.5 VAPOR DENSITY:</b>	Not determined
<b>9.6 SOLUBILITY IN WATER:</b>	Dissolves with precipitation of elemental sulfur.
<b>9.7 SPECIFIC GRAVITY:</b>	1.27 (10.6 lbs/gal)
<b>9.8 FREEZING POINT:</b>	Not determined
<b>9.9 pH:</b>	11.0 - 11.9
<b>9.10 VOLATILE:</b>	Not applicable

<b>Section</b>	<b>10:</b>	<b>STABILITY and REACTIVITY</b>
----------------	------------	---------------------------------

**10.1 STABILITY:** This is a stable material

**10.2 HAZARDOUS POLYMERIZATION:** Will not occur.

**10.3 HAZARDOUS DECOMPOSITION PRODUCTS:** Heating this product will evolve hydrogen sulfide vapors. Continued heating will also cause oxides of sulfur to be released.

**10.4 INCOMPATIBILITY:** Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness. Acids, acidic materials or dilution with water will cause the release of hydrogen sulfide, a highly toxic gas.

<b>Section</b>	<b>11:</b>	<b>TOXICOLOGICAL INFORMATION</b>
----------------	------------	----------------------------------

**11.1 ORAL:** Data not available

**11.2 DERMAL:** Data not available

**11.3 INHALATION:** Data not available

**11.4 CHRONIC/CARCINOGENICITY:** No evidence available

**11.5 TERATOLOGY:** Data not available

**11.6 REPRODUCTION:** Data not available

**11.7 MUTAGENICITY:** Data not available

<b>Section</b>	<b>12:</b>	<b>ECOLOGICAL INFORMATION</b>
----------------	------------	-------------------------------

No data available.

<b>Section</b>	<b>13: DISPOSAL CONSIDERATIONS</b>
----------------	------------------------------------

If released to the environment for other than its intended purpose, this product should be checked to see it meets the criteria of a D002, Corrosive waste. In addition the product contains some reactive sulfides but not a sufficient quantity to meet the definition of a D003, Reactive waste.

<b>Section</b>	<b>14: TRANSPORT INFORMATION</b>
----------------	----------------------------------

**14.1 DOT Shipping Name:** Corrosive liquid, toxic, n.o.s.

**14.2 DOT Hazard Class:** 8

**14.3 UN/NA Number:** 2922

**14.4 Packing Group:** II

**14.5 DOT Placard:** Corrosive

**14.6 DOT Label(s):** Corrosive

**14.7 IMO Shipping Name:** Corrosive liquid, toxic, n.o.s.

**14.8 RQ (Reportable Quantity):** Not applicable

**14.9 RR STCC Number:**

<b>Section</b>	<b>15: REGULATORY INFORMATION</b>
----------------	-----------------------------------

**15.1 OSHA:** This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**15.2 SARA TITLE III:**

a.	<b>EHS</b> (Extremely Hazardous Substance) List:	No
b.	Section 311/312, (Tier I,II) Categories:	Immediate (acute) Yes
	Fire	No
	Sudden release	No
	Reactivity	Yes
	Delayed (chronic)	No
c.	Section 313 (Toxic Release Reporting-Form R):	No

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration</u>
----------------------	-------------------	----------------------

**15.2 SARA TITLE III: (Cont.)**

d.	<b>TPQ</b> (Threshold Planning Quantity):	No
----	---	----

**15.3 CERCLA/SUPERFUND:** RQ (Reportable Quantity) No

<b>Section</b>	<b>15: REGULATORY INFORMATION (Cont.)</b>
----------------	---

<b>15.4 TSCA</b> (Toxic Substance Control Act) Inventory List:	Yes	
<b>15.5 RCRA</b> (Resource Conservation and Recovery Act) Status:		Possible D002 (See Section 13)
<b>15.6 WHMIS</b> (Canada) Hazard Classification:	E, D2B	
<b>15.7 DOT</b> Hazardous Material: (See Section 14)	Yes	
<b>15.8 CAA</b> Hazardous Air Pollutant (HAP)	No	

<b>Section</b>	<b>16: OTHER INFORMATION</b>
----------------	------------------------------

**REVISIONS:** The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993, by Technical Services-Tessenderlo Kerley, Inc.

Address updated, 4/30/99

Section 8.3, Eye Protection revised and logo revised, 4/29/02

<p>THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.</p>
---

# Safety Data Sheet

according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.14.2014

Page 1 of 7

## Calcium Hydroxide,

### SECTION 1 : Identification of the substance/mixture and of the supplier

**Product name :** Calcium Hydroxide,

**Manufacturer/Supplier Trade name:**

**Manufacturer/Supplier Article number:** S25225

**Recommended uses of the product and uses restrictions on use:**

**Manufacturer Details:**

AquaPhoenix Scientific  
9 Barnhart Drive, Hanover, PA 17331

**Supplier Details:**

Fisher Science Education  
15 Jet View Drive, Rochester, NY 14624

**Emergency telephone number:**

Fisher Science Education Emergency Telephone No.: 800-535-5053

### SECTION 2 : Hazards identification

**Classification of the substance or mixture:**



**Irritant**

Skin irritation, category 2

Specific target organ toxicity following single exposure, category 3



**Corrosive**

Serious eye damage, category 1

Skin Irritation 2

Eye Damage 1

Specific Target Organ Toxicity, Single Exposure (respiratory) 3

**Signal word :**Danger

**Hazard statements:**

**Precautionary statements:**

If medical advice is needed, have product container or label at hand

Keep out of reach of children

Read label before use

Wash ... thoroughly after handling

Wear protective gloves/protective clothing/eye protection/face protection

Avoid breathing dust/fume/gas/mist/vapours/spray

Use only outdoors or in a well-ventilated area

Do not eat, drink or smoke when using this product

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.

Continue rinsing

If eye irritation persists get medical advice/attention

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

IF ON SKIN: Wash with soap and water

If skin irritation occurs: Get medical advice/attention

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### Calcium Hydroxide,

Specific treatment (see ... on this label)

Store locked up

Store in a well ventilated place. Keep container tightly closed

#### Combustible Dust Hazard: :

May form combustible dust concentrations in air (during processing).

#### Other Non-GHS Classification:

##### WHMIS



##### NFPA/HMIS



NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

### SECTION 3 : Composition/information on ingredients

#### Ingredients:

CAS 1305-62-0

Calcium Hydroxide

>95 %

Percentages are by weight

### SECTION 4 : First aid measures

#### Description of first aid measures

**After inhalation:** Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical advice if discomfort or irritation persists. If breathing difficult, give oxygen.

**After skin contact:** Wash affected area with soap and water. Rinse thoroughly. Seek medical attention if irritation, discomfort or vomiting persists.

**After eye contact:** Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

**After swallowing:** Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

#### Most important symptoms and effects, both acute and delayed:

Skin, eye, and upper respiratory tract irritation. Irritation, Nausea, Headache, Shortness of breath.;

#### Indication of any immediate medical attention and special treatment needed:

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### Calcium Hydroxide,

If seeking medical attention, provide SDS document to physician.

#### SECTION 5 : Firefighting measures

##### Extinguishing media

**Suitable extinguishing agents:** If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition

**For safety reasons unsuitable extinguishing agents:** Carbon Dioxide

##### Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Thermal decomposition can lead to release of irritating gases and vapors. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Calcium Oxide.

##### Advice for firefighters:

**Protective equipment:** Use NIOSH-approved respiratory protection/breathing apparatus.

**Additional information (precautions):** Move product containers away from fire or keep cool with water spray as a protective measure, where feasible. Use spark-proof tools and explosion-proof equipment.

#### SECTION 6 : Accidental release measures

##### Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Transfer to a disposal or recovery container. Use spark-proof tools and explosion-proof equipment. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Protect from heat. Stop the spill, if possible. Contain spilled material by diking or using inert absorbent.

##### Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13

##### Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures. Collect liquids using vacuum or by use of absorbents. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

##### Reference to other sections:

#### SECTION 7 : Handling and storage

##### Precautions for safe handling:

Minimize dust generation and accumulation. Wash hands after handling. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan. Use only in well ventilated areas. Avoid generation of dust or fine particulate. Avoid contact with eyes, skin, and clothing.

##### Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents. Store in cool, dry conditions in well sealed containers. Keep container tightly sealed.

#### SECTION 8 : Exposure controls/personal protection

## Safety Data Sheet

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### Calcium Hydroxide,



#### Control Parameters:

1305-62-0, Calcium hydroxide, NIOSH REL: TWA 5 mg/m<sup>3</sup>  
1305-62-0, Calcium hydroxide, ACGIH TLV TWA 5 mg/m<sup>3</sup>  
1305-62-0, Calcium hydroxide, OSHA PEL TWA: 15 mg/m<sup>3</sup> (total dust)  
1305-62-0, Calcium hydroxide, OSHA PEL TWA: 5 mg/m<sup>3</sup> (respirable fraction)

#### Appropriate Engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Use under a fume hood. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

#### Respiratory protection:

Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

#### Protection of skin:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

#### Eye protection:

Safety glasses with side shields or goggles.

#### General hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

### SECTION 9 : Physical and chemical properties

<b>Appearance (physical state,color):</b>	Off - white solid	<b>Explosion limit lower: Explosion limit upper:</b>	Not Determined Not Determined
<b>Odor:</b>	Odorless	<b>Vapor pressure:</b>	Not Determined
<b>Odor threshold:</b>	Not Determined	<b>Vapor density:</b>	Not Determined
<b>pH-value:</b>	12.4 saturated solution	<b>Relative density:</b>	2.24
<b>Melting/Freezing point:</b>	580 C	<b>Solubilities:</b>	ND = Not Determined. N/A = Not Applicable. Slightly soluble in water.



## Safety Data Sheet

according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.14.2014

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### Calcium Hydroxide,

<b>Boiling point/Boiling range:</b>	2850C	<b>Partition coefficient (n-octanol/water):</b>	Not Determined
<b>Flash point (closed cup):</b>	Not Determined	<b>Auto/Self-ignition temperature:</b>	Not Determined
<b>Evaporation rate:</b>	Not Determined	<b>Decomposition temperature:</b>	Not Determined
<b>Flammability (solid,gaseous):</b>	Not Determined	<b>Viscosity:</b>	a. Kinematic:Not Determined b. Dynamic: Not Determined
<b>Density:</b> Not Determined			

### SECTION 10 : Stability and reactivity

**Reactivity:**Nonreactive under normal conditions.

**Chemical stability:**No decomposition if used and stored according to specifications.

**Possible hazardous reactions:**None under normal processing

**Conditions to avoid:**Store away from oxidizing agents, strong acids or bases.Incompatible Materials.Dust generation.excess heat.

**Incompatible materials:**Metals, acids, bases, strong oxidizing and reducing agents.

**Hazardous decomposition products:**Carbon oxides (CO, CO<sub>2</sub>).Oxides of calcium.

### SECTION 11 : Toxicological information

<b>Acute Toxicity:</b>		
<b>Oral:</b>	7340 mg/kg	LD50 (rat)
<b>Chronic Toxicity:</b> No additional information.		
<b>Corrosion Irritation:</b> No additional information.		
<b>Sensitization:</b>	No additional information.	
<b>Single Target Organ (STOT):</b>	May cause respiratory irritation.	
<b>Numerical Measures:</b>	No additional information.	
<b>Carcinogenicity:</b>	No additional information.	
<b>Mutagenicity:</b>	No additional information.	
<b>Reproductive Toxicity:</b>	No additional information.	

### SECTION 12 : Ecological information

**Ecotoxicity Persistence and degradability:** Readily degradable in the environment.

**Bioaccumulative potential:**

**Mobility in soil:**

**Other adverse effects:**

### SECTION 13 : Disposal considerations

**Waste disposal recommendations:**

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### Calcium Hydroxide,

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

#### SECTION 14 : Transport information

##### UN-Number

3262

##### UN proper shipping name

Corrosive solid, basic, inorganic, n.o.s.

##### Transport hazard class(es)



##### Class:

8 Corrosive substances

##### Packing group:III

##### Environmental hazard:

##### Transport in bulk:

##### Special precautions for user:

#### SECTION 15 : Regulatory information

##### United States (USA)

##### SARA Section 311/312 (Specific toxic chemical listings):

Acute

##### SARA Section 313 (Specific toxic chemical listings):

None of the ingredients is listed

##### RCRA (hazardous waste code):

None of the ingredients is listed

##### TSCA (Toxic Substances Control Act):

All ingredients are listed.

##### CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

None of the ingredients is listed

##### Proposition 65 (California):

##### Chemicals known to cause cancer:

None of the ingredients is listed

##### Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

##### Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

##### Chemicals known to cause developmental toxicity:

None of the ingredients is listed

##### Canada

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### Calcium Hydroxide,

#### Canadian Domestic Substances List (DSL):

All ingredients are listed.

#### Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

#### Canadian NPRI Ingredient Disclosure list (limit 1%):

1305-62-0 Calcium hydroxide

### SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

#### GHS Full Text Phrases:

#### Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

PNEC: Predicted No-Effect Concentration (REACH)

CFR: Code of Federal Regulations (USA)

SARA: Superfund Amendments and Reauthorization Act (USA)

RCRA: Resource Conservation and Recovery Act (USA)

TSCA: Toxic Substances Control Act (USA)

NPRI: National Pollutant Release Inventory (Canada)

DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

DNEL: Derived No-Effect Level (REACH)

Effective date : 12.14.2014

Last updated : 03.19.2015



# SAFETY DATA SHEET

## 1. Identification

Product identifier	RemOx® S ISCO Reagent
Other means of identification	Not available.
Recommended use	Remediation of soils and groundwater.
Recommended restrictions	Use in accordance with supplier's recommendations.
<b>Manufacturer / Importer / Supplier / Distributor information</b>	
Manufacturer/Supplier	CARUS CORPORATION
Address	315 Fifth Street, Peru, IL 61354, USA
Telephone	815 223-1500 - All other non-emergency inquiries about the product should be directed to the company salesmkt@caruscorporation.com
E-mail	www.caruscorporation.com
Website	Dr. Chithambarathanu Pillai
Contact person	For Hazardous Materials [or Dangerous Goods] Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC at CHEMTREC®, USA: 001 (800) 424-9300 CHEMTREC®, Mexico (Toll-Free - must be dialed from within country): 01-800-681-9531 CHEMTREC®, Other countries: 001 (703) 527-3887
Emergency Telephone	

## 2. Hazard(s) identification

Physical hazards	Oxidizing solids	Category 2
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 1B
	Specific target organ toxicity, single exposure	Category 1 (Respiratory System)
	Specific target organ toxicity, repeated exposure	Category 1 (Respiratory System, central nervous system)
OSHA defined hazards	Not classified.	

### Label elements



Signal word Danger

**Hazard statement** May intensify fire; oxidizer. Harmful if swallowed. Causes severe skin burns and eye damage. Causes damage to organs (Respiratory System). Causes damage to organs (Respiratory System, central nervous system) through prolonged or repeated exposure.

### Precautionary statement

#### Prevention

Keep away from heat. Take any precaution to avoid mixing with combustibles/ Keep/Store away from clothing//combustible materials. Wash thoroughly after handling. Do not breathe dust. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product.

#### Response

In case of fire: Use water for extinction. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor.

#### Storage

Store locked up.

#### Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

### Hazard(s) not otherwise classified (HNOC)

Not classified.

### Environmental hazards

Hazardous to the aquatic environment, long-term hazard Category 1

### 3. Composition/information on ingredients

#### Substances

Chemical name	Common name and synonyms	CAS number	%
Potassium permanganate		7722-64-7	> 97.5

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

### 4. First-aid measures

<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Get medical attention immediately.
<b>Skin contact</b>	Take off immediately all contaminated clothing. Immediately flush skin with plenty of water. Get medical attention immediately. Wash contaminated clothing before reuse.  Contact with skin may leave a brown stain of insoluble manganese dioxide. This can be easily removed by washing with a mixture of equal volume of household vinegar and 3% hydrogen peroxide, followed by washing with soap and water.
<b>Eye contact</b>	Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids wide apart. Continue rinsing. Get medical attention immediately.
<b>Ingestion</b>	Immediately rinse mouth and drink plenty of water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention immediately.
<b>Most important symptoms/effects, acute and delayed</b>	Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage including blindness could result.
<b>Indication of immediate medical attention and special treatment needed</b>	Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen. Decomposition products are alkaline. Brown stain is insoluble manganese dioxide.
<b>General information</b>	In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Flood with water from a distance, water spray or fog.
<b>Unsuitable extinguishing media</b>	The following extinguishing media are ineffective: Dry chemical. Foam. Carbon dioxide (CO <sub>2</sub> ). Halogenated materials.
<b>Specific hazards arising from the chemical</b>	May intensify fire; oxidizer. May ignite combustibles (wood, paper, oil, clothing, etc.). Contact with incompatible materials or heat (135 °C / 275 °F) could result in violent exothermic chemical reaction. Oxidizing agent, may cause spontaneous ignition of combustible materials. By heating and fire, corrosive vapors/gases may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
<b>Fire-fighting equipment/instructions</b>	Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Dike fire control water for later disposal. Water runoff can cause environmental damage.

### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Keep upwind. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of vapors and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet. Local authorities should be advised if significant spillages cannot be contained.
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## Methods and materials for containment and cleaning up

Keep combustibles (wood, paper, oil, etc.) away from spilled material. Should not be released into the environment. This product is miscible in water. Stop leak if possible without any risk. Dike the spilled material, where this is possible. Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container; transfer to a clean metal or plastic drum. To clean up potassium permanganate solutions, follow either of the following two options:

Option # 1: Dilute to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water.

Option # 2: Absorb with inert media like diatomaceous earth or inert floor dry, collect into a drum and dispose of properly. Do not use saw dust or other incompatible media. Disposal of all materials shall be in full and strict compliance with all federal, state, and local regulations pertaining to permanganates.

To clean contaminated floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations. If not, collect water and treat as described above.

Never return spills in original containers for re-use. For waste disposal, see Section 13 of the MSDS.

## Environmental precautions

Do not allow to enter drains, sewers or watercourses. Contact local authorities in case of spillage to drain/aquatic environment.

## 7. Handling and storage

### Precautions for safe handling

Take any precaution to avoid mixing with combustibles. Keep away from clothing and other combustible materials. Do not get this material in your eyes, on your skin, or on your clothing. Do not breathe dust or mist or vapor of the solution. If clothing becomes contaminated, remove and wash off immediately. When using, do not eat, drink or smoke. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Avoid release to the environment.

### Conditions for safe storage, including any incompatibilities

Store locked up. Keep container tightly closed and in a well-ventilated place. Store in a cool, dry place. Store away from incompatible materials (See Section 10). Follow applicable local/national/international recommendations on storage of oxidizers. Store in accordance with NFPA 430 requirements for Class II oxidizers.

Before using, read Material Safety Data Sheet (MSDS) for this product.

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Potassium permanganate (CAS 7722-64-7)	Ceiling	5 mg/m <sup>3</sup>

#### US. ACGIH Threshold Limit Values

Components	Type	Value
Potassium permanganate (CAS 7722-64-7)	TWA	0.2 mg/m <sup>3</sup>

#### US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Components	Type	Value	Form
Potassium permanganate (CAS 7722-64-7)	TWA	1 mg/m <sup>3</sup>	Fume.

#### US NIOSH Pocket Guide to Chemical Hazards: Short Term Exposure Limit (STEL)

Components	Type	Value	Form
Potassium permanganate (CAS 7722-64-7)	STEL	3 mg/m <sup>3</sup>	Fume.

### Biological limit values

No biological exposure limits noted for the ingredient(s).

### Exposure guidelines

Follow standard monitoring procedures.

### Appropriate engineering controls

Provide adequate general and local exhaust ventilation. An eye wash and safety shower must be available in the immediate work area.

### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Wear safety glasses with side shields (or goggles). Wear face shield if there is risk of splashes.

<b>Skin protection</b>	
<b>Hand protection</b>	Use protective gloves made of: Rubber or plastic. Suitable gloves can be recommended by the glove supplier.
<b>Other</b>	Wear chemical-resistant, impervious gloves.
<b>Respiratory protection</b>	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134.
	Measurement Element: Manganese (Mn)
	10 mg/m <sup>3</sup> Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100. Any supplied-air respirator.
	25 mg/m <sup>3</sup> Any supplied-air respirator operated in a continuous-flow mode. Any powered, air-purifying respirator with a high-efficiency particulate filter.
	50 mg/m <sup>3</sup> Any air-purifying, full-face piece respirator equipped with an N100, R100, or P100 filter. Any supplied-air respirator with a tight-fitting face piece that is operated in a continuous-flow mode. Any powered, air-purifying respirator with a tight-fitting face piece and a high-efficiency particulate filter. Any self-contained breathing apparatus with a full face piece. Any supplied-air respirator with a full face piece.
	500 mg/m <sup>3</sup> Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.
	Emergency or planned entry into unknown concentrations or IDLH conditions - Any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode.
	Escape Any air-purifying, full-face piece respirator equipped with an N100, R100, or P100 filter. Any appropriate escape-type, self-contained breathing apparatus.
<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>General hygiene considerations</b>	When using, do not eat, drink or smoke. Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Appearance</b>	Dark purple solid with metallic luster.
<b>Physical state</b>	Solid.
<b>Form</b>	Solid.
<b>Color</b>	Dark purple.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not applicable.
<b>Melting point/freezing point</b>	Starts to decompose with evolution of oxygen (O <sub>2</sub> ) at temperatures above 150 °C. Once initiated, the decomposition is exothermic and self sustaining.
<b>Initial boiling point and boiling range</b>	Not applicable.
<b>Flash point</b>	Not applicable.
<b>Evaporation rate</b>	Not applicable.
<b>Flammability (solid, gas)</b>	Non flammable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not applicable.
<b>Flammability limit - upper (%)</b>	Not applicable.
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.

Vapor pressure	Not applicable.
Vapor density	Not applicable.
Relative density	2.7 (20 °C) ( Water = 1)
Solubility(ies)	6 % (20 °C) 20 % (65 °C)
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not applicable.
Other information	
Explosive properties	Not explosive. Can explode in contact with sulfuric acid, peroxides and metal powders.
Molecular weight	158.03
Oxidizing properties	Strong oxidizing agent.

## 10. Stability and reactivity

Reactivity	The product is non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable at normal conditions.
Possibility of hazardous reactions	Contact with combustible material may cause fire. Can explode in contact with sulfuric acid, peroxides and metal powders. Starts to decompose with evolution of oxygen (O2) at temperatures above 150 °C. Once initiated, the decomposition is exothermic and self sustaining.
Conditions to avoid	Contact with incompatible materials or heat (135 °C / 275 °F) could result in violent exothermic chemical reaction.
Incompatible materials	Acids. Peroxides. Reducing agents. Combustible material. Metal powders. Contact with hydrochloric acid liberates chlorine gas.
Hazardous decomposition products	By heating and fire, corrosive vapors/gases may be formed.

## 11. Toxicological information

### Information on likely routes of exposure

Ingestion	Harmful if swallowed.
Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics	Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage including blindness could result.
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### Information on toxicological effects

Acute toxicity	Harmful if swallowed.
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Components	Species	Test Results
Potassium permanganate (CAS 7722-64-7)		
Acute		
Oral		
LD50	Rat	780 mg/kg, 14 days, (Male) 525 mg/kg, 14 days, (Female)
Skin corrosion/irritation	Causes severe skin burns.	
Serious eye damage/eye irritation	Causes serious eye damage.	
Respiratory sensitization	Not classified.	
Skin sensitization	Not classified.	
Germ cell mutagenicity	Not classified.	
Carcinogenicity	Not classified.	
Reproductive toxicity	Not classified.	
Specific target organ toxicity - single exposure	Causes damage to organs (respiratory system).	



<b>Specific target organ toxicity - repeated exposure</b>	Causes damage to organs (respiratory system, central nervous system) through prolonged or repeated exposure.
<b>Aspiration hazard</b>	Not classified.
<b>Chronic effects</b>	May cause damage to respiratory system. Prolonged exposure, usually over many years, to manganese oxide fume/dust can lead to chronic manganese poisoning, chiefly affecting the central nervous system.
<b>Further information</b>	No other specific acute or chronic health impact noted.

## 12. Ecological information

**Ecotoxicity** Very toxic to aquatic life with long lasting effects.

Components		Species	Test Results
Potassium permanganate (CAS 7722-64-7)			
Aquatic			
Fish	LC50	Bluegill (Lepomis macrochirus)	2.7 mg/l, 96 hours, static
			2.3 mg/l, 96 hours, flow through
			2.3 mg/l, 96 hours
			1.8 - 5.6 mg/l
		Carp (Cyprinus carpio)	3.16 - 3.77 mg/l, 96 hours
			2.97 - 3.11 mg/l, 96 hours
		Goldfish (Carassius auratus)	3.3 - 3.93 mg/l, 96 hours, static
		Milkfish, salmon-herring (Chanos chanos)	> 1.4 mg/l, 96 hours
		Rainbow trout (Oncorhynchus mykiss)	1.8 mg/l, 96 hours
			1.08 - 1.38 mg/l, 96 hours
			0.77 - 1.27 mg/l, 96 hours
		Rainbow trout,donaldson trout (Oncorhynchus mykiss)	0.275 - 0.339 mg/l, 96 hours

**Persistence and degradability** Expected to be readily converted by oxidizable materials to insoluble manganese oxide.

**Bioaccumulative potential** Potential to bioaccumulate is low.

**Mobility in soil** Not available.

**Mobility in general** The product is water soluble and may spread in water systems.

**Other adverse effects** None known.

## 13. Disposal considerations

**Disposal instructions** Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations** Dispose in accordance with all applicable regulations.

**Hazardous waste code** D001: Ignitable waste  
The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products** Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

**Contaminated packaging** Since emptied containers may retain product residue, follow label warnings even after container is emptied. Rinse container at least three times to an absence of pink color before disposing. Empty containers should be taken to an approved waste handling site for recycling or disposal.

## 14. Transport information

### DOT

<b>UN number</b>	UN1490
<b>UN proper shipping name</b>	Potassium permanganate
<b>Transport hazard class(es)</b>	5.1
<b>Subsidiary class(es)</b>	-
<b>Packing group</b>	II
<b>Special precautions for user</b>	Read safety instructions, MSDS and emergency procedures before handling.
<b>Labels required</b>	5.1
<b>Special provisions</b>	IB8, IP2, IP4, T3, TP33
<b>Packaging exceptions</b>	152
<b>Packaging non bulk</b>	212
<b>Packaging bulk</b>	240

**IATA**

UN number	UN1490
UN proper shipping name	Potassium permanganate
Transport hazard class(es)	5.1
Subsidiary class(es)	-
Packaging group	II
Environmental hazards	Yes
Labels required	5.1
ERG Code	5L
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

**IMDG**

UN number	UN1490
UN proper shipping name	POTASSIUM PERMANGANATE
Transport hazard class(es)	5.1
Subsidiary class(es)	-
Packaging group	II
Environmental hazards	
Marine pollutant	Yes
Labels required	5.1
EmS	F-H, S-Q
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** This substance/mixture is not intended to be transported in bulk.

**15. Regulatory information****US federal regulations**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.  
  
CERCLA/SARA Hazardous Substances - Not applicable.  
  
Drug Enforcement Administration (DEA) (21 CFR 1310.02 (b) 8: List II chemical.  
  
Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (6 CFR 27, Appendix A): Listed.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<b>Hazard categories</b>	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
<b>SARA 302 Extremely hazardous substance</b>	No
<b>SARA 311/312 Hazardous chemical</b>	Yes

**Other federal regulations****Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Potassium permanganate (CAS 7722-64-7)

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

<b>Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)</b>	Hazardous substance
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<b>Safe Drinking Water Act (SDWA)</b>	Not regulated.
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**Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number**

Potassium permanganate (CAS 7722-64-7) 6579

**Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))**

Potassium permanganate (CAS 7722-64-7) 15 % wt

**DEA Exempt Chemical Mixtures Code Number**

Potassium permanganate (CAS 7722-64-7) 6579

**Food and Drug Administration (FDA)** Not regulated.

**US state regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

California OSH Hazardous Substance List: Listed.

**US. Massachusetts RTK - Substance List**

Potassium permanganate (CAS 7722-64-7)

**US. New Jersey Worker and Community Right-to-Know Act**

Potassium permanganate (CAS 7722-64-7) 500 lbs

**US. Pennsylvania RTK - Hazardous Substances**

Potassium permanganate (CAS 7722-64-7)

**US. Rhode Island RTK**

Not regulated.

**US. California Proposition 65**

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Not listed.

**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information, including date of preparation or last revision**

**Issue date** 04-03-2013  
**Revision date** -  
**Version #** 01  
**Further information** Not available.  
**List of abbreviations** LD50: Lethal Dose, 50%.  
LC50: Lethal Concentration, 50%.

**References**

HSDB® - Hazardous Substances Data Bank  
Registry of Toxic Effects of Chemical Substances (RTECS)  
ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
US. IARC Monographs on Occupational Exposures to Chemical Agents  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

## Disclaimer

This safety data sheet was prepared in accordance with the Safety Data Sheet for Chemical Products (JIS Z 7250:2005). The information contained herein is accurate to the best of our knowledge. However, data, safety standards and government regulations are subject to change and, therefore, holders and users should satisfy themselves that they are aware of all current data and regulations relevant to their particular use of product. CARUS CORPORATION DISCLAIMS ALL LIABILITY FOR RELIANCE ON THE COMPLETENESS OR ACCURACY OR THE INFORMATION INCLUDED HEREIN. CARUS CORPORATION MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR USE OR PURPOSE OF THE PRODUCT DESCRIBED HEREIN. All conditions relating to storage, handling, and use of the product are beyond the control of Carus Corporation, and shall be the sole responsibility of the holder or user of the product.

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RemOx® S ISCO reagent has been specifically manufactured for environmental applications such as remediation of soils and associated groundwater. This product can be used to degrade a variety of contaminants including chlorinated solvents, polyaromatic hydrocarbons, phenolics, organo-pesticides, and substituted aromatics. RemOx S is shipped with a certificate of analysis to document assay and trace metals.

## REMEDICATION GRADE

### Assay

≥ 98.8% as  $\text{KMnO}_4$

### Trace Metals

(see Table I)

## CHEMICAL/PHYSICAL DATA

<b>Formula</b>	$\text{KMnO}_4$
<b>Formula Weight</b>	158.0 g/mol
<b>Form</b>	Granular Crystalline
<b>Specific Gravity</b>	
Solid	2.703 g/cm <sup>3</sup>
3% Solution	1.020 g/mL by weight, 20° C/ 4° C
<b>Bulk Density</b>	Approximately 100 lb/ft <sup>3</sup>
<b>Decomposition may start at</b>	<b>150° C/ 302° F</b>

## SOLUBILITY IN DISTILLED WATER

Temperature		Solubility	
°C	°F	g/L	oz/gal
0	32	27.8	3.7
20	68	65.0	8.6
40	104	125.2	16.7
60	140	230.0	30.7
70	158	286.4	38.3
75	167	323.5	43.2

## SHIPPING CONTAINERS

**25 kg pail** (55.12 lbs) net, with handle, made of high-density polyethylene (HDPE), weighs 2.1 lbs (.95 kg). It is tapered to allow nested storage of empty pails, stands approximately 15.6 inches (39.7 cm) high and has a maximum diameter of 12.3 inches (31.2 cm). (Domestic and international)

**150 kg drum** (330.75 lbs) net, made of 12-gauge steel, weighs 25.3 lbs (11.5 kg). It stands approximately 28.4 inches (72.2 cm) high and is approximately 19.7 inches (50.0 cm) in diameter. (Domestic and international)

## SHIPPING CONTAINERS

**907-kg FIBC (Flexible Intermediate Bulk Container) (2000-lb) net**, (UN13H4/Y/0909), made of woven plastic, coated with inner poly liner. Dimensions are 30 inches (76.2 cm) high, 30 inches (76.2 cm) long, and 48 inches (121.9 cm) wide. The spout diameter is 14 inches (35.6 cm) and extends 18 inches (45.7 cm) in length. (Domestic only)

**1000-MT FIBC (Flexible Intermediate Bulk Container) (2205-lb) net**, made of woven plastic, coated with inner poly liner. Dimensions are 30 inches (76.2 cm) high, 30 inches (76.2 cm) long, and 48 inches (121.9 cm) wide. The spout diameter is 14 inches (35.6 cm) and extends 18 inches (45.7 cm) in length. (International only)

**Special Packages will be considered upon request.**

**Packaging meets UN performance-oriented packaging requirements.**

## DESCRIPTION

Crystals or granules are dark purple with a metallic sheen, sometimes with a dark bronze-like appearance. RemOx S has a sweetish, astringent taste and is odorless.

## HANDLING, STORAGE, AND INCOMPATIBILITY

Protect containers against physical damage. When handling RemOx S, European Community (CE) approved respirators should be worn to avoid irritation of, or damage to, mucous membranes. Eye protection should also be worn when handling RemOx S as a solid or in solution.

Store in accordance with NFPA 30 requirements in the United States or the European Fire Protection Association in Europe for Class II oxidizers. Additional regulations in Europe are REACH (Regulation for Registration, Evaluation, Authorisation and Restriction of Chemicals), and CLP (Classification, Labeling, Packaging). REACH is a regulation that increases the responsibility of the industry to manage the risks that the chemical may pose. For REACH registration numbers refer to the eSDS. Check local regulations to ensure proper storage.

RemOx S is stable and will keep indefinitely if stored in a cool, dry area in closed containers. Concrete floors are preferred to wooden decks. To clean up spills and leaks, follow the steps recommended in the SDS or eSDS. Be sure to use goggles, rubber gloves, and respirator when cleaning up a spill or leak.



## HANDLING, STORAGE, AND INCOMPATIBILITY

Avoid contact with acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated. RemOx® S ISCO reagent is not combustible, but it will support combustion. It may decompose if exposed to intense heat. Fires may be controlled and extinguished by using large quantities of water. Refer to the SDS or eSDS for more information.

## SHIPPING

RemOx S is classified by the Hazardous Materials Transportation Board (HMTB) and The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), as an oxidizer. It is shipped under Interstate Commerce Commission's (ICC) Tariff 19.

**Proper Shipping Name:** Potassium Permanganate (RQ-100/45.4)  
**Hazard Class:** Oxidizer, Class 5.1  
**Identification Number:** UN 1490  
**Division/ADR/RID Class:** 5.1  
**Label Requirements:** Oxidizer, 5.1  
**Packaging Group:** II  
**Packaging Requirements:** 49 CFR Parts 100 to 199  
**Sections:** 173.152, 173.153, 173.194  
**Shipping Limitations:**  
*Minimum quantities:*  
Rail car: See Tariff for destination  
Truck: No minimum  
H.S. Code 28.41.61.00

## SHIPPING

### Postal regulations:

Information applicable to packaging of oxidizers for shipment by the U.S. Postal Service to domestic and foreign destinations is readily available from the local postmaster. United Parcel Service accepts 25 lbs (11.3 kg) as largest unit quantity properly packaged; (consult United Parcel Service). According to ADR Regulation, transportation should not exceed 1.1.3.6. LIMITS, transport category 2, maximum authorized per transport unit, 333 kg. Regulations concerning shipping and packing should be consulted regularly due to frequent changes.

## CORROSIVE PROPERTIES

RemOx S is compatible with many metals and synthetic materials. Natural rubbers and fibers are often incompatible. Solution pH and temperature are also important factors. The material must be compatible with either the acid or alkali also being used.

In neutral and alkaline solutions, RemOx S is not corrosive to iron, mild steel, or stainless steel; however, chloride corrosion of metals may be accelerated when an oxidant such as permanganate is present in solution. Plastics such as polypropylene, polyvinyl chloride Type I (PVC I), epoxy resins, fiberglass reinforced plastic (FRP), Penton, Lucite, Viton A, and Hypalon are suitable. Teflon FEP and TFE, and Tefzel ETFE are best. Refer to Material Compatibility Chart.

Aluminum, zinc, copper, lead, and alloys containing these metals may be (slightly) affected by RemOx S solutions. Actual studies should be made under the conditions in which permanganate will be used.

Table I: Typical Trace Metal Content and Specifications

Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)	Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)
Ag	BDL	0.40	0.048	Hg	BDL	0.05	0.004
Al	55.85	115.00	0.28	Na	228.03	750	0.069
As	0.04	4.00	0.006	Ni	0.78	5.00	0.048
Ba	10.60	50.00	0.016	Pb	BDL	1.00	0.20
Be	BDL	0.50	0.10	Sb	BDL	1.00	0.20
Cd	BDL	0.10	0.02	Se	BDL	1.00	0.002
Cr	1.60	7.50	0.028	Ti	BDL	5.00	1.00
Cu	0.15	3.00	0.034	Zn	0.87	6.00	0.016
Fe	0.22	100.00	0.066	DL* = Detection limit			BDL = Below detection limit



## HIx-Nano™ 100+

HIx-Nano100+ is a hybrid anion exchange resin doped with a mixture of hydrated iron and zirconium oxide nanoparticles irreversibly inside resin beads. WIST Water Solutions Pvt. Ltd. Kolkata, India (brand-name “drinkwell”), currently is engaged in commercial-scale production of different HIx-Nano media suitable for removal of a variety of trace contaminants (e.g. Arsenic, Fluoride, iron, phosphate etc ) from water. HIx-Nano100+ resin is suitable for selective removal of dissolved arsenic (both arsenate and arsenite) present in contaminated waters from the background other ionic species usually present in much higher concentrations. The parent resin has macroporous structure with polystyrene matrix and divinylbenzene crosslinking. HIx-Nano100+ is a robust, durable, high capacity sorbent media that efficiently reduces arsenic in treated water to levels recommended by World Health Organization (WHO). The media is regenerable, can be used for multiple cycles without losing its performance and thereby greatly reducing the cost of treated water.

### Physical & Chemical characteristics:

Appearance	Spherical beads, dark brown/ reddish
Structure	Macroporous polystyrene beads
Particle size	0.3 – 1.2 mm
Shipping weight (approx.)	700 – 760 g/L
Ionic form as shipped	Cl <sup>-</sup>
Operating capacity (Arsenic)*	3-12 gm/kg

*\* Operating equilibrium capacity depends on influent contaminant concentration; type of contaminant, operation pH, presence of interfering species & other background species, process chemistry & kinetics, etc. References of peer-reviewed publications are available at <http://drinkwellsystems.com/resources?category=Journal+Articles>*

### Application (site installation) and Bed features:

Recommended application of HIx-Nano100+ is for removal of dissolved arsenic species from contaminated water supplies. It needs occasional/ periodic backwash and does not generate any arsenic contaminated fines or wastes. The media is stable over a wide range of pH (2.5 –



13). It is Amenable to regeneration reduces operating and maintenance cost significantly and reduces volume of waste by an order of magnitude.

Recommended contact time <sup>#</sup>	2 - 4 min
Recommended bed depth <sup>#</sup>	around 900 mm or more
Service flow	Intermittent / Continuous
Backwash	Periodic/ occasional
Operating pH (recommended)	4 – 8
Operating temperature limit	50°C
Operating pressure	20 – 75 psia
Pressure drop	Low due to porous structure of beads

<sup>#</sup>

*To be selected carefully for design purpose based on detail water quality, provision of pre-treatment, process flow etc in consideration with physical structure & properties of media, media kinetics & related intrinsic process features.*

#### **Storage:**

HIX media is packed in HDPE lined bag. It should be kept under proper cover or storage shade. This resin is never recommended for keeping in open condition or under sun-light.

#### **Regeneration & Safety:**

HIX-Nano100+ offers a very high capacity for arsenic sorption. The regeneration interval for the media is recommended to be a year or more based on influent quality, water production & good O&M practices with proper design. Drinkwell as a part of its service program strongly recommends replacement of exhausted media by fresh/ regenerated media (provided by Drinkwell) for safe, environment friendly handling and disposal of arsenic laden waste.



**Regd. Office: 78 Biren Roy Road West, Kolkata 700061**  
**Web address: [www.drinkwellsystems.com](http://www.drinkwellsystems.com)**

### SECTION 1: Identification

#### 1.1. Identification

Product form	: Mixture
Trade name	: FerroBlack® -FS27
CAS No	: 1317-37-9
Formula	: FeS
Synonyms	: Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide / Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: Chemical used for the removal and/or sequestering of mercury. Also used as a mercury re-emission prevention chemical in wet flue gas desulfurization units.
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#### 1.3. Details of the supplier of the safety data sheet

Redox Technology Group, LLC  
d/b/a Redox Solutions  
1580 Research Way  
Indianapolis, IN 46231

Company Contact: Jim Kissel  
Telephone Number: (317) 660-6867 or (317) 412-3267

#### 1.4. Emergency telephone number

CHEMTREC: (800) 424-9300

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Skin corrosion/irritation Category 2	H315
Serious eye damage/eye irritation Category 2A	H319
Full text of H statements : see section 16	

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US)



GHS07

Signal word (GHS-US)	: Warning
Hazard statements (GHS-US)	: H315 - Causes skin irritation H319 - Causes serious eye irritation
Precautionary statements (GHS-US)	: P264 - Wash hands thoroughly after handling P280 - Wear eye protection, protective clothing, protective gloves P302+P352 - If on skin: Wash with plenty of water P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P321 - Specific treatment (see Consult a doctor/medical service if you feel unwell on this label) P332+P313 - If skin irritation occurs: Get medical advice/attention P337+P313 - If eye irritation persists: Get medical advice/attention P362+P364 - Take off contaminated clothing and wash it before reuse

# FerroBlack®-FS27

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### 2.3. Other hazards

#### HMIS Classification:

Health hazard: 0  
Flammability: 0  
Physical hazards: 0

#### NFPA Rating:

Health hazard: 1  
Fire: 0  
Reactivity Hazard: 0

**Inhalation** May be harmful if inhaled. May cause respiratory tract irritation.

**Skin** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

**Ingestion** May be harmful if swallowed.

**Other Hazards not contributing to the classification:** Generates toxic gas in contact with acid.

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	GHS-US classification
Iron sulfide (FeS)	(CAS No) 1317-37-9	7 -11	Not classified
Sodium Sulfide	(CAS No) 1313-82-2	0.1 - 1	Acute Tox. 3 (Oral), H301

Full text of hazard classes and H-statements : see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general	: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
First-aid measures after skin contact	: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor/physician. Call a poison center/doctor/physician if you feel unwell.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	: Causes skin and eye irritation.
Symptoms/injuries after skin contact	: Irritation.
Symptoms/injuries after eye contact	: Causes serious eye damage. Eye irritation.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	: Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media	: Do not use a heavy water stream.

### 5.2. Special hazards arising from the substance or mixture

Reactivity	: Corrosive vapors.
------------	---------------------

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### 5.3. Advice for firefighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

- Emergency procedures : Ventilate spillage area. Evacuate unnecessary personnel. Avoid contact with skin and eyes.

#### 6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Ventilate area.

### 6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

- Methods for cleaning up : Take up liquid spill into absorbent material. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.
- Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe dust, fume, gas, mist, spray, vapors. Avoid contact during pregnancy/while nursing. Avoid contact with skin and eyes. Wear personal protective equipment.
- Hygiene measures : Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

### 7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Comply with applicable regulations.
- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Ignition sources, Incompatible materials. Keep container closed when not in use. Store in a well-ventilated place. Keep cool.
- Incompatible products : Strong bases. Strong acids.
- Incompatible materials : Sources of ignition. Direct sunlight.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

FerroBlack-FS27 (1317-37-9)		
ACGIH	ACGIH TWA (mg/m³)	1.4 mg/m³
ACGIH	ACGIH TWA (ppm)	1 ppm
ACGIH	ACGIH STEL (mg/m³)	7 mg/m³
ACGIH	ACGIH STEL (ppm)	5 ppm
Iron sulfide (FeS) (1317-37-9)		
Not applicable		
Sodium sulfide (1313-82-2)		
Not applicable		

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### 8.2. Exposure controls

Appropriate engineering controls	: Ensure good ventilation of the work station.
Personal protective equipment	: Avoid all unnecessary exposure.
Hand protection	: Wear protective gloves.
Eye protection	: Chemical goggles or face shield. Safety glasses.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: Wear appropriate mask.
Environmental exposure controls	: Avoid release to the environment.
Other information	: Do not eat, drink or smoke during use.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Black liquid with visible suspended solids.
Color	: Black
Odor	: Rotten eggs
Odor threshold	: No data available
pH	: 11.5 - 12.8
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: Non flammable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: 1.15 - 1.22
Solubility	: Minimally soluble in water.
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Acidic vapors.

### 10.2. Chemical stability

Not established.

### 10.3. Possibility of hazardous reactions

Contact with acids liberates toxic gas.

### 10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

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### 10.5. Incompatible materials

Acids will cause the release of highly toxic Hydrogen Sulfide. Reacts violently with diazonium salts. Ferrous sulfide(s) solution is not compatible with copper, zinc, aluminum or their **alloys** (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150° F (65.5° C). These materials of construction should not be used in handling systems or storage containers for this product.

### 10.6. Hazardous decomposition products

Hazardous decomposition products formed under fire may include sulfur oxides, iron oxides.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Sodium Sulfide (113-82-2)	
LD50 oral rat	208 mg/kg
ATE US (oral)	208.000 mg/kg body weight
LD50 dermal rabbit	< 340 mg/kg
ATE US (dermal)	300.000 mg/kg body weight

Skin corrosion/irritation : Causes skin irritation.  
pH: 11.5 - 12.8

Serious eye damage/irritation : Causes eye irritation.  
pH: 11.5 - 12.8

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after skin contact : Irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

FerroBlack-FS27 (1317-37-9)	
LC50 fish 1	> 10000 mg/l Mosquito fish

Sodium Sulfide (1313-82-2)	
LC50 fish 1	7.7 - 29.1 mg/l (Exposure time: 96 h - Species: Poecilia reticulata)
EC50 Daphnia 1	2.1 mg/l (Exposure time: 48 h - Species: Daphnia magna)

### 12.2. Persistence and degradability

FerroBlack-FS27 (1317-37-9)	
Persistence and degradability	Not established.



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### 12.3. Bioaccumulative potential

#### FerroBlack-FS27 (1317-37-9)

Bioaccumulative potential	Not established.
---------------------------	------------------

#### Sodium Sulfide (16721-80-5)

Log Pow	-3.5 (at 25 °C)
---------	-----------------

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Effect on the global warming : No known effects from this product.

GWPmix comment : No known effects from this product.

Other information : Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Waste disposal recommendations : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Ecology - waste materials : Avoid release to the environment.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Not Regulated

### Transport by sea

Not Regulated

### Air transport

Not Regulated

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
---

#### Sodium Sulfide (1313-82-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
---

### 15.2. International regulations

#### CANADA

#### Iron sulfide (FeS) (1317-37-9)

Listed on the Canadian DSL (Domestic Substances List)
---

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
----------------------	---

#### Sodium Sulfide (1313-82-2)

Listed on the Canadian DSL (Domestic Substances List)
---

### EU-Regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
--

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### Sodium Sulfide (1313-82-2)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### National regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

#### Sodium Sulfide (1313-82-2)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on INSQ (Mexican National Inventory of Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)

### 15.3. US State regulations

#### Sodium Sulfide (1313-82-2)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List

## SECTION 16: Other information

Revision date : 06/14/2016

Other information : None.

Full text of H-phrases:

H301	Toxic if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H400	Very toxic to aquatic life

SDS US (GHS HazCom 2012)

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

### SECTION 1: Identification

#### 1.1. Identification

Product form : Mixture  
 Trade name : FerroBlack®-H  
 CAS No : 1317-37-9  
 Formula : FeS  
 Synonyms : Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide / Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Chemical used for the remediation of heavy metal(s) for liquid and solid wastes.

#### 1.3. Details of the supplier of the safety data sheet

Redox Technology Group, LLC  
 d/b/a Redox Solutions  
 1580 Research Way  
 Indianapolis, IN 46231

Company Contact: Jim Kissel  
 Telephone Number: (317) 660-6867 or (317) 412-3267

#### 1.4. Emergency telephone number

CHEMTREC: (800) 424-9300

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Skin corrosion/irritation Category 2 H315  
 Serious eye damage/eye irritation Category 2A H319  
 Full text of H statements : see section 16

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



GHS07

Signal word (GHS-US) : Warning  
 Hazard statements (GHS-US) : H315 - Causes skin irritation  
 H319 - Causes serious eye irritation  
 Precautionary statements (GHS-US) : P264 - Wash hands thoroughly after handling  
 P280 - Wear eye protection, protective clothing, protective gloves  
 P302+P352 - If on skin: Wash with plenty of water  
 P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
 P321 - Specific treatment (see Consult a doctor/medical service if you feel unwell on this label)  
 P332+P313 - If skin irritation occurs: Get medical advice/attention  
 P337+P313 - If eye irritation persists: Get medical advice/attention  
 P362+P364 - Take off contaminated clothing and wash it before reuse

**APPENDIX B**

**HACH TEST METHOD SUMMARY**

**APPENDIX B**

**HACH TEST METHOD SUMMARY**



## EZ Arsenic

For test kit 2822800 (EZ Arsenic)

0 to 500, 0 to 4000 ppb As

DOC326.98.00006

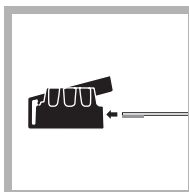
Additional copies available on [www.hach.com](http://www.hach.com)

### Test preparation

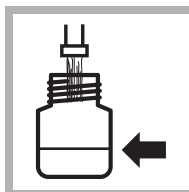
- For samples with sulfide greater than 15 ppb, follow the [Optional procedure for removing sulfide](#) before performing the test.
- Do not expose reacted strips to direct sunlight. Reaction products are photosensitive and may turn dark.
- Do not allow test strips to touch the reaction vessel solution. Test strips react with gases, not solution.
- Orient the test strip pad **paper side down** and **centered** over the hole in the black cap so the generated gases can make good contact with the pad.
- Two samples may be analyzed simultaneously with this kit.

**DANGER: Hydrogen and arsine gasses are generated during the test. Work in a well-ventilated area away from open flames and other sources of ignition. Review Material Safety Data Sheets for safe handling, storage and disposal information.**

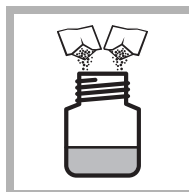
### 0–500 ppb (0, 10, 25, 50, 100, 250, 500 ppb) test procedure



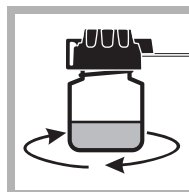
1. Insert a test strip into the cap so the pad completely covers the small opening. Close the flap and press to secure.



2. Fill the reaction bottle with sample to the fill line (50 mL).



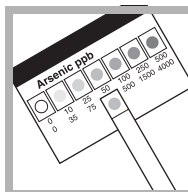
3. Add one Reagent #1 and one Reagent #2 powder pillow to the sample.



4. Immediately attach the cap to the reaction bottle. Swirl continuously for 60 seconds. **Do not shake or invert or allow sample to get on the strip.**

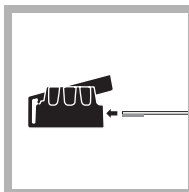


5. Wait 20 minutes. Swirl twice during the reaction period.

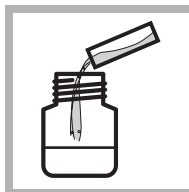


6. Remove the test strip and immediately compare the developed color to the chart on the test strip bottle (0–500 ppb row). Read strips in the shade.

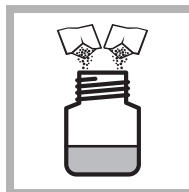
### 0–4000 ppb (0, 35, 75, 175, 500, 1500, 4000 ppb) test procedure



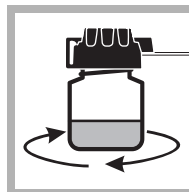
1. Insert a test strip into the cap so the pad completely covers the small opening. Close the flap and press to secure.



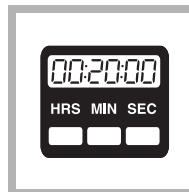
2. Fill the square measuring vial to the top with sample (9.6 mL). Pour the sample into the reaction bottle.



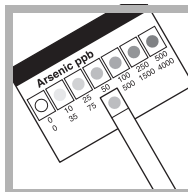
3. Add one Reagent #1 and one Reagent #2 powder pillow to the sample.



4. Immediately attach the cap to the reaction bottle. Swirl continuously for 60 seconds. **Do not shake or invert or allow sample to get on the strip.**



5. Wait 20 minutes. Swirl twice during the reaction period.



6. Remove the test strip and immediately compare the developed color to the chart on the test strip bottle (0–4000 ppb row). Read strips in the shade.

### Required items

Description	Unit	Catalog no.
EZ Arsenic Reagent Set	each	2823200
Reaction Bottle	each	2800200
Cap, reaction bottle	each	4934800

### Interferences

Refer to [Table 1](#) and [Table 2](#) for interference information. Interferences other than those listed are not likely.

Table 1 Interfering substances

Ion or Substance	Concentration
Acidity	< pH 5. Do not acid-preserve samples. If samples are below pH 5, adjust pH to between 5 and 6 before beginning test.
Antimony	> 250 ppb
Nitric acid	Interferes with the reduction step. Do not use samples preserved with nitric acid because low results will be observed. If samples must be preserved, use HCl or sulfamic acid to adjust sample to pH 2. Adjust to pH 5–7 before running the test.
Selenium	> 1 ppm
Sulfide	>15 ppb (see <a href="#">Optional procedure for removing sulfide</a> )
Tellurium	Likely to interfere, but not tested.

Table 2 Non-interfering substances

Ion or Substance	Highest concentration tested
Alkalinity	1000 ppm as CaCO <sub>3</sub>
Hardness	1000 ppm as CaCO <sub>3</sub>
Iron	100 ppm
Temperature	10 to 40 °C (50 to 104 °F)

### Optional procedure for removing sulfide

If a rotten egg smell is detected after adding reagent #1, sulfide is present at interfering levels. Complete the following steps to remove the sulfide before beginning the test procedure:

- Tear off a small piece of cotton and form a ball the size of a pea.
- Saturate the cotton with a few drops of lead acetate. Squeeze the excess liquid out of the cotton, leaving it damp.
- Press the saturated cotton ball into the small opening of the reaction bottle cap from the bottom. Be sure that the cotton is firmly in place and that a gap remains between the cotton and the top surface of the cap.
- Insert the test strip as detailed in step 1 of the 0–500 or 0–4000 ppb test procedure and continue with the test.

**Note:** The lead acetate must not contact the test strip!

Always wear gloves or wash hands thoroughly after handling lead acetate.





# EZ Arsénico

Para el Test Kit 2822800 (EZ Arsénico)

0 a 500 ppb, 0 a 4000 ppb de As

DOC326.98.00006

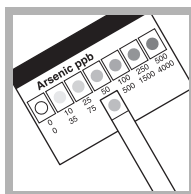
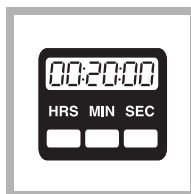
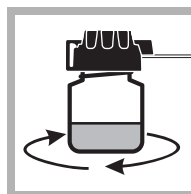
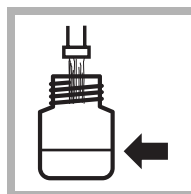
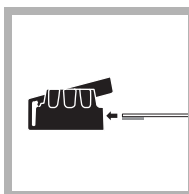
Se pueden conseguir más copias en [www.hach.com](http://www.hach.com)

## Preparación del análisis

- Si las muestras tienen más de 15 ppb de sulfuro, siga el [Procedimiento opcional para eliminar el sulfuro](#) antes de realizar el análisis.
- No exponer al sol las tiras que ya hayan reaccionado. Los productos reactivos son fotosensibles y se pueden oscurecer.
- Evitar que las tiras de análisis toquen la solución del recipiente de reacción. Las tiras de análisis reaccionan ante gases, no ante una solución.
- Orientar el lado de **papel** de la almohadilla de la tira reactiva **hacia abajo y centrado** sobre el orificio en la tapa negra de manera que los gases generados entren bien en contacto con la almohadilla.
- Se pueden analizar dos muestras a la vez con este Kit.

**PELIGRO:** Durante el análisis, se generan gases de hidrógeno y arsina. Trabajar en una zona bien ventilada, lejos del fuego y otras fuentes de combustión. Estudiar las Fichas de Seguridad sobre manipulación, almacenamiento y eliminación sin riesgos.

## Procedimiento de análisis de 0 a 500 ppb (0, 10, 25, 50, 100, 250, 500 ppb)



1. Introducir una tira de análisis en la tapa de manera que la almohadilla cubra el orificio pequeño por completo. Cerrar la parte superior de la tapa y presionar para que quede bien cerrada.

2. Llenar el frasco de reacción con muestra hasta la marca (50-mL).

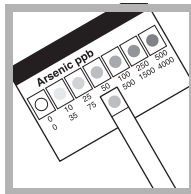
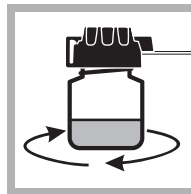
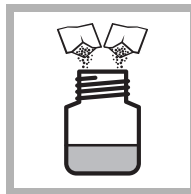
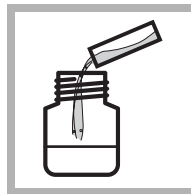
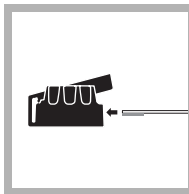
3. Añadir a la muestra un sobre del reactivo en polvo N° 1 y un sobre del reactivo en polvo N° 2.

4. Tapar inmediatamente el frasco de reacción. Agitar, con rotación, para mezclar la solución 2 veces durante 60 segundos. **No sacudir ni invertir la muestra y evitar que toque la tira.**

5. Esperar 20 minutos. Agitar, con rotación, para mezclar la solución 2 veces durante el período de reacción.

6. Retirar la tira de análisis y comparar inmediatamente el color manifestado con la tabla ubicada en el frasco de tiras de análisis (hileras de 0 a 500 ppb). Leer el resultado de las tiras a la sombra.

## Procedimiento de análisis de 0 a 4000 ppb (0, 35, 75, 175, 500, 1500, 4000 ppb)



1. Introducir una tira de análisis en la tapa de manera que la almohadilla cubra el orificio pequeño por completo. Cerrar la parte superior de la tapa y presionar para que quede bien cerrada.

2. Llenar la cubeta cuadrada de medición hasta el tope con muestra (9.6-mL). Verter la muestra en el frasco de reacción.

3. Añadir a la muestra un sobre del reactivo en polvo N° 1 y un sobre del reactivo en polvo N° 2.

4. Tapar inmediatamente el frasco de reacción. Agitar, con rotación, para mezclar la solución 2 veces durante 60 segundos. **No sacudir ni invertir la muestra y evitar que toque la tira.**

5. Esperar 20 minutos. Agitar, con rotación, para mezclar la solución 2 veces durante el período de reacción.

6. Retirar la tira de análisis y comparar inmediatamente el color manifestado con la tabla ubicada en el frasco de tiras de análisis (hileras de 0 a 4000 ppb). Leer el resultado de las tiras a la sombra.

## Elementos necesarios

Descripción	Unidad	Ref.
Conjunto de reactivos EZ Arsénico	cada uno	2823200
Frasco de reacción	cada uno	2800200
Tapa del frasco de reacción	cada uno	4934800

## Interferencias

Consultar la [Tabla 1](#) y [Tabla 2](#) para obtener información sobre las interferencias. No es probable que aparezcan otras interferencias que las enumeradas.

**Tabla 1 Sustancia de interferencia**

ión o sustancia	Concentración
Acidez	< pH 5. No conservar las muestras en ácido. Si el pH de las muestras es inferior a 5, regúlelo entre 5 y 6 antes de comenzar el análisis.
Antimonio	> 250 ppb
Ácido nítrico	Interfiere en la etapa de reducción. No usar muestras conservadas con ácido nítrico porque se observarán resultados bajos. Si debe conservar las muestras, usar HCl o ácido sulfámico para regular en 2 el pH de la muestra. Antes de realizar el análisis, regular el pH entre 5 y 7.
Selenio	> 1 ppm
Sulfuro	> 15 ppb (consultar el <a href="#">Procedimiento opcional para eliminar el sulfuro</a> )
Telurio	Probablemente interfiera, pero no se ha probado.

**Tabla 2 Sustancias que no interfieren**

ión o sustancia	Las concentraciones más altas que se han analizado
Alcalinidad	1000 ppm como CaCO <sub>3</sub>
Dureza	1000 ppm como CaCO <sub>3</sub>
Hierro	100 ppm
Temperatura	10 a 40 °C (50 a 104 °F)

## Procedimiento opcional para eliminar el sulfuro

Si se detecta olor a huevo podrido luego de agregar el reactivo N° 1, hay sulfuro a niveles que pueden interferir en el resultado. Seguir los pasos que se describen a continuación para eliminar el sulfuro antes de comenzar el análisis:

1. Tomar un pedacito de algodón y haga una bolita del tamaño de un guisante.
2. Saturar el algodón con unas gotas de acetato de plomo. Exprimirla para eliminar el exceso de líquido del algodón, pero que quede húmedo.
3. Presionar la bolita de algodón empapada en el orificio pequeño de la tapa del frasco de reacción por la parte inferior de ésta. Asegurar de que el algodón esté colocado con firmeza y que quede un espacio entre el algodón y parte superior de la tapa.
4. Introducir la tira de análisis como se explica en el paso 1 del procedimiento de análisis de 0 a 500 ppb o 0 a 4000 ppb y proseguir con éste.

**Nota:** ¡El acetato de plomo no debe entrar en contacto con la tira de análisis!

Siempre usar guantes o lávese bien las manos tras manipular acetato de plomo.



## EZ Arsênico

Para o kit de teste 2822800 (EZ Arsênico)

0 a 500, 0 a 4000 ppb As

DOC326.98.00006

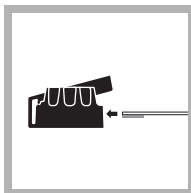
Cópias adicionais disponíveis em [www.hach.com](http://www.hach.com)

### Preparação do teste

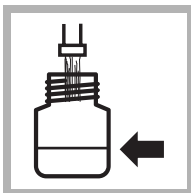
- Para amostras com sulfeto superior a 15 ppb, seguir o [Procedimento opcional para remoção de sulfeto](#) antes de executar o teste.
- Não expor as tiras que sofreram reação à luz do sol direta. Os produtos reativos são fotossensíveis e podem escurecer.
- Não permitir que as tiras de teste toquem a solução do recipiente de reação. As tiras de teste reagem com gases, não soluções.
- Orientar o suporte da tira de teste com o lado do **papel para baixo e centralizado** sobre o orifício na tampa preta para que os gases gerados possam ter bom contato com o suporte.
- Duas amostras podem ser analisadas simultaneamente com este kit.

**PERIGO: Gases de hidrogênio e arsina são gerados durante o teste. Trabalhar em uma área bem ventilada e distante de chamas ou outras fontes de ignição. Analisar os documentos de segurança de materiais para obter informações sobre segurança de manuseio, armazenagem e descarte.**

### Procedimento de teste de 0–500 ppb (0, 10, 25, 50, 100, 250, 500 ppb)



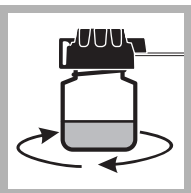
1. Inserir a tira de teste no suporte de forma que ele cubra totalmente a pequena abertura. Fechar o flap e pressionar para fixar a tira.



2. Encher o recipiente de reação com a amostra até o nível da linha de enchimento (50 mL).



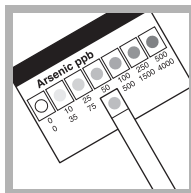
3. Adicionar um pacote de Reagente No. 1 e um pacote de Reagente No. 2 à amostra.



4. Imediatamente colocar a tampa no recipiente de reação. Girar continuamente por 60 segundos. **Não agitar, inverter ou permitir que a amostra toque a tira.**

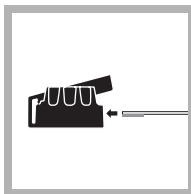


5. Aguardar 20 minutos. Girar duas vezes durante o período de reação.

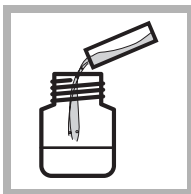


6. Remover a tira de teste e comparar imediatamente a cor desenvolvida com o gráfico no recipiente das tiras de teste (linha 0–500 ppb). Ler as tiras na sombra.

### procedimento de teste de 0-4000 ppb (0, 35, 75, 175, 500, 1500, 4000 ppb)



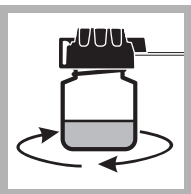
1. Inserir a tira de teste no suporte de forma que ele cubra totalmente a pequena abertura. Fechar o flap e pressionar para fixar a tira.



2. Encher o frasco de medida quadrado até o topo com a amostra (9.6 mL). Colocar a amostra no recipiente de reação.



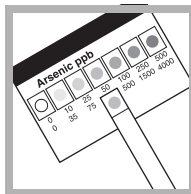
3. Adicionar um pacote de Reagente No. 1 e um pacote de Reagente No. 2 à amostra.



4. Imediatamente colocar a tampa no recipiente de reação. Girar continuamente por 60 segundos. **Não agitar, inverter ou permitir que a amostra toque a tira.**



5. Aguardar 20 minutos. Girar duas vezes durante o período de reação.



6. Remover a tira de teste e comparar imediatamente a cor desenvolvida com o gráfico no recipiente das tiras de teste (linha 0–4000 ppb). Ler as tiras na sombra.

### Itens necessários

Descrição	Unidade	No. Cat.
Conjunto de reagentes EZ Arsênico	cada	2823200
Recipiente de reação	cada	2800200
Tampa, recipiente de reação	cada	4934800

### Interferências

Consultar a [Tabela 1](#) e a [Tabela 2](#) para obter informações de interferência. Interferências não relacionadas não são prováveis.

Tabela 1 Substâncias interferentes

Íon ou substância	Concentração
Acidez	< pH 5. Não preservar as amostras em ácido. Se as amostras estiverem abaixo do pH 5, ajustar o pH entre 5 e 6 antes de iniciar o teste.
Antimônio	> 250 ppb
Ácido nítrico	Interfere na etapa de redução. Não utilizar amostras preservadas com ácido nítrico, pois os resultados serão mais baixos. Se as amostras tiverem que ser preservadas, utilize HCl ou ácido sulfâmico para ajustar a amostra para pH 2. Ajustar a amostra em pH 5–7 antes de executar o teste.
Selênio	> 1 ppm
Sulfeto	> 15 ppb (consultar o <a href="#">Procedimento opcional para remoção de sulfeto</a> )
Telúrio	Provavelmente interfere, mas não foi testado.

Tabela 2 Substâncias não interferentes

Íon ou substância	Concentração mais alta testada
Alcalinidade	1000 ppm como CaCO <sub>3</sub>
Dureza	1000 ppm como CaCO <sub>3</sub>
Ferro	100 ppm
Temperatura	10 a 40 °C (50 a 104 °F)

### Procedimento opcional para remoção de sulfeto

Se for observado odor de ovo podre após a adição do reagente #1, há presença de sulfeto em níveis interferentes. Concluir as etapas a seguir para remoção de sulfeto antes de iniciar o procedimento de teste:

- Rasgar um pequeno pedaço de algodão e formar uma bola do tamanho de uma ervilha.
- Saturar o algodão com algumas gotas de acetato de chumbo. Apertar o líquido excedente do algodão, deixando o mesmo úmido.
- Pressionar a bola de algodão saturada na pequena abertura da tampa do recipiente de reação na parte inferior. Verificar se o algodão está firme e se há uma lacuna entre o algodão e a superfície superior da tampa.
- Inserir a tira de teste conforme o descrito na etapa 1 do procedimento de teste 0–500 ou 0–4000 ppb e continuar o teste.

**Nota:** O acetato de chumbo não deve entrar em contato com a tira de teste! Sempre utilizar luvas ou lave as mãos cuidadosamente após lidar com acetato de chumbo.



## ইজি আর্সেনিক

পরীক্ষার সামগ্রীর জন্য ২৮-২২৮০০ (ইজি আর্সেনিক)

০ থেকে ৫০০, ০ থেকে ৪০০০ পিপিবি অনুযায়ী

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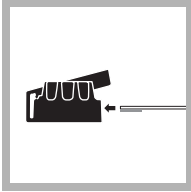
অতিরিক্ত কপি পাওয়া যাবে [www.hach.com](http://www.hach.com) এই ওয়েবসাইটে

### পরীক্ষার প্রকৃতি

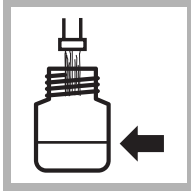
- ১৫ পিপিবি-র বেশি সালফাইড নমুনার জন্য, পরীক্ষা শুরুর আগে [সালফাইড দূর করার বিকল্প পদ্ধতি](#) অনুসরণ করুন।
- যে স্টিপগুলোয় প্রতিক্রিয়া হয়েছে সেগুলো সরাসরি সূর্যের আলোয় অনাবৃত রাখবেন না। প্রতিক্রিয়াযুক্ত দ্রব্যগুলো ফোটোসেন্সিটিভ এবং সেগুলো কালো হয়ে যেতে পারে।
- খোয়াল রাখবেন যে পরীক্ষা স্টিপগুলো যেন প্রতিক্রিয়াযুক্ত দ্রবণের আধার স্পর্শ না করে। পরীক্ষার স্টিপগুলোর সঙ্গে গ্যাসের বিক্রিয়া হয়, দ্রবণের সঙ্গে হয় না।
- পারিপার্শ্বিক অবস্থার সঙ্গে খাপ খাইয়ে স্টিপগুলোর প্যাডের কাগজ পাশে নামিয়ে ও কালো ঢাকনার ফুটোর মাঝখানে ধরুন যাতে উৎপন্ন গ্যাস ভালভাবে প্যাডের সংস্পর্শে আসতে পারে।
- এই কিটের মাধ্যমে একই সময়ে দুটি নমুনা বিশ্লেষণ করা যেতে পারে।

**বিপদ: এই পরীক্ষার সময় হাইড্রোজেন ও আর্সিন গ্যাস উৎপন্ন হয়। খোলা আঙুন ও অন্যান্য ইকনের থেকে দূরে ভালভাবে আলো-বাতাস খেলে এমন স্থানে কাজ করুন। নিরাপদে নাড়াচাড়া করা, সংরক্ষণ এবং বর্জন করার ক্ষেত্রে উপকরণ নিরাপত্তার তথ্য সম্বলিত পৃষ্ঠাগুলো পর্যালোচনা করুন।**

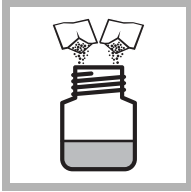
#### ০-৫০০ পিপিবি (০, ১০, ২৫, ৫০, ১০০, ২৫০, ৫০০ পিপিবি) পরীক্ষা পদ্ধতি



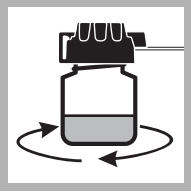
১. ঢাকনার ভিতর একটি পরীক্ষার স্টিপ চুকিয়ে দিন যাতে প্যাডটি ছোট প্রবেশ পথের সব স্থানে ছড়িয়ে যেতে পারে। ঢাকনা বন্ধ করে দিন ও নিশ্চিত হওয়ার জন্য চাপ দিয়ে দেখুন।



২. বোতলের মধ্যে নির্দিষ্ট চিহ্ন অবধি (৫০ এমএল) নমুনা দিয়ে ভর্তি করুন।



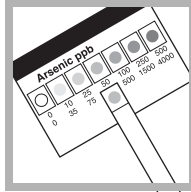
৩. নমুনার সঙ্গে একটি ১ নম্বর বিক্রিয়াশীল পদার্থ বা রিএজেন্ট নম্বর ১ এবং একটি ২ নম্বর বিক্রিয়াশীল পদার্থ বা রিএজেন্ট নম্বর ২ পাউডার পিলো মেশান।



৪. সঙ্গে সঙ্গে রিঅ্যাকশন বোতলের ঢাকনা বন্ধ করুন। অবিরাম ৬০ সেকেন্ড ধরে সোঁটকে পাক খাওন। **বাঁকানো না বা ওল্টাবেন না কিংবা স্টিপের উপর নমুনাটি চলে যেতে যেন না।**

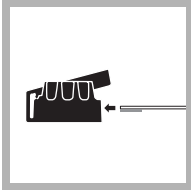


৫. ২০ মিনিট অপেক্ষা করুন প্রতিক্রিয়ার সময় দুবার পাক খাওন।

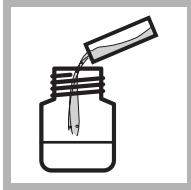


৬. পরীক্ষা স্টিপ বের করে নিন ও শীঘ্র পরীক্ষা স্টিপের বোতলের (০-৫০০ পিপিবি শ্রেণি) সারণির সঙ্গে উৎপন্ন রঙ মিলিয়ে দেখে নিন। স্টিপের ছায়াবৃত জায়গাটি পড়ে নিন।

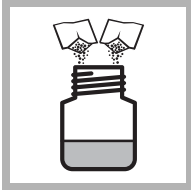
#### ০-৪০০০ পিপিবি (০, ৩৫, ৭৫, ১৭৫, ৫০০, ১৫০০, ৪০০০ পিপিবি) পরীক্ষা পদ্ধতি



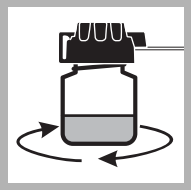
১. ঢাকনার ভিতর একটি পরীক্ষার স্টিপ চুকিয়ে দিন যাতে প্যাডটি ছোট প্রবেশ পথের সব স্থানে ছড়িয়ে যেতে পারে। ঢাকনা বন্ধ করে দিন ও নিশ্চিত হওয়ার জন্য চাপ দিয়ে দেখুন।



২. স্কোয়ার মাপার ভায়ালাটি নমুনা (৯৬ এমএল) দিয়ে উপরে ভর্তি করে দিন। রিঅ্যাকশন বোতলে নমুনাটি ঢালুন।



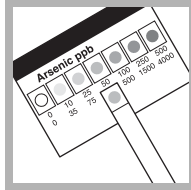
৩. নমুনার সঙ্গে একটি ১ নম্বর বিক্রিয়াশীল পদার্থ বা রিএজেন্ট নম্বর ১ এবং একটি ২ নম্বর বিক্রিয়াশীল পদার্থ বা রিএজেন্ট নম্বর ২ পাউডার পিলো মেশান।



৪. সঙ্গে সঙ্গে রিঅ্যাকশন বোতলের ঢাকনা বন্ধ করুন। অবিরাম ৬০ সেকেন্ড ধরে সোঁটকে পাক খাওন। **বাঁকানো না বা ওল্টাবেন না কিংবা স্টিপের উপর নমুনাটি চলে যেতে যেন না।**



৫. ২০ মিনিট অপেক্ষা করুন। প্রতিক্রিয়ার সময় দুবার পাক খাওন।



৬. পরীক্ষা স্টিপ বের করে নিন ও শীঘ্র পরীক্ষা স্টিপের বোতলের (০-৪০০০ পিপিবি শ্রেণি) সারণির সঙ্গে উৎপন্ন রঙ মিলিয়ে দেখে নিন। স্টিপের ছায়াবৃত জায়গাটি পড়ে নিন।

### প্রয়োজনীয় জিনিসপত্র

বিবরণ	ইউনিট বা মাত্রা	ক্যাটালগ নম্বর
ইজি আর্সেনিক রিএজেন্ট সেট	প্রতিটি	২৮২৩২০০
রিঅ্যাকশন বোতল	প্রতিটি	২৮০০২০০
ঢাকনা, রিঅ্যাকশন বোতল	প্রতিটি	৪৯৩৪৮০০

### প্রতিবন্ধকতা

প্রতিবন্ধকতার তথ্যের জন্য ১ নম্বর সারণি ও ২ নম্বর সারণি উল্লেখ করুন। যেগুলো ডালিকায় রয়েছে তার বাইরে অন্য কোনও প্রতিবন্ধকতা সব নয়।

#### ১ নম্বর সারণি প্রতিবন্ধকতার বস্তুগুলো

আয়ন অথবা বস্তু	ঘনীভূত হওয়া
অ্যাসিডিটি	< পি এইচ ৫ অ্যাসিডে নমুনা সংরক্ষণ করবেন না। নমুনাগুলো যদি পি এইচ ৫-এর কম হয়, তবে পরীক্ষা শুরুর আগে ৫ ও ৬-এর মধ্যে পি এইচ পুনর্নিয়ন্ত্রণ করে নিন।
অ্যান্টিমনি	> ২৫০ পিপিবি
নাইট্রিক অ্যাসিড	হ্রাস করার প্রক্রিয়ায় বাধা। নাইট্রিক অ্যাসিডে সংরক্ষিত নমুনা ব্যবহার করবেন না। করলে নিম্নস্তরের ফল মিলবে। নমুনা সংরক্ষণ করতেই হলে, নমুনাটির পি এইচ ২ স্তরে পুনর্নিয়ন্ত্রণের জন্য এইচ সি আই অথবা সালফেমিক অ্যাসিড ব্যবহার করুন। পরীক্ষা চালানোর আগে পি এইচ ৫-৭এ পুনর্নিয়ন্ত্রণ করে নিন।
সেলেনিয়াম	> ১ পিপিএম
সালফাইড	> ১৫ পিপিবি (সালফাইড দূর করার বিকল্প পদ্ধতি দেখুন)
টেলুরিয়াম	বাধার সাবনা, তবে পরীক্ষিত নয়।

#### ২ নম্বর সারণি প্রতিবন্ধকহীন বস্তুগুলো

আয়ন বা বস্তু	সর্বোচ্চ ঘনত্ব পরীক্ষিত
অ্যালকালিনিটি বা ক্ষারত্ব	১০০০ পিপিএম বা সিএসিও৩ অনুযায়ী
কার্বন্যা	১০০০ পিপিএম বা সিএসিও৩ অনুযায়ী
লোহা	১০০ পিপিএম
তাপমাত্রা	১০ থেকে ৪০ ডিগ্রি সেন্টিগ্রেড (৫০ থেকে ১০৪ ডিগ্রি ফারেনহাইট)

### সালফাইড দূর করার বিকল্প পদ্ধতি

১ নম্বর বিক্রিয়াশীল পদার্থ মেশানোর পর যদি পচা ডিমের গন্ধ পাওয়া যায়, তবে বুঝতে হবে সালফাইড বাধা দেওয়ার স্তরে রয়েছে। পরীক্ষা পদ্ধতি শুরু করার আগে সালফাইড নির্মূল করার জন্য নিম্নলিখিত পর্যায়গুলো সমাপ্ত করুন।

- অল্প একটু তুলো ছিঁড়ে নিয়ে মটরশুঁটির মত গোল করে পাকিয়ে নিন।
- কয়েক ফোঁটা লেড অ্যাসিটেট দিয়ে তুলোটি ভিজিয়ে নিন। তুলো থেকে অতিরিক্ত তরল চেপে বার করে দিন, ভেজা অবস্থায় রেখে দিন।
- রিঅ্যাকশন বোতলের ঢাকনার নীচের দিক থেকে ভেজা তুলোর বগটি ফাঁকা জায়গা দিয়ে চেপে চুকিয়ে দিন। তুলোটা ভালভাবে বসেছে কিনা দেখে নিন এবং ঢাকনার উপরদিকের অংশের সঙ্গে তুলোর ফাঁক রয়েছে কিনা, তাও নিশ্চিত হয়ে নিন।
- ১ নম্বর পর্যায় ০-৫০০ অথবা ০-৪০০০ পিপিবি পরীক্ষা পদ্ধতিতে যেভাবে বলা হয়েছে সেইভাবে পরীক্ষা স্টিপ প্রবেশ করিয়ে বিশ্লেষণ চালিয়ে যান।

**টীকা:** লেড অ্যাসিটেট যেন কোনওভাবেই পরীক্ষার স্টিপের সংস্পর্শে না আসে।

সবসময় হাতে দস্তানা পরে থাকবেন অথবা লেড অ্যাসিটেট নাড়াচাড়া করার পর ভাল করে হাত ধোবেন।

## USEPA<sup>1</sup> FerroVer<sup>®</sup> Method<sup>2</sup>

## Method 8008

0.02 to 3.00 mg/L Fe

Powder Pillows or AccuVac<sup>®</sup> Ampuls

**Scope and application:** For water, wastewater and seawater; digestion is required for determining total iron.

<sup>1</sup> USEPA approved for reporting wastewater analysis, Federal Register, June 27, 1980; 45 (126:43459).

<sup>2</sup> Adapted from Standard Methods for the Examination of Water and Wastewater.



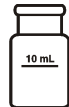
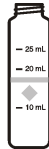
## Test preparation

## Instrument-specific information



Table 1 shows sample cell and orientation requirements for reagent addition tests, such as powder pillow or bulk reagent tests. Table 2 shows sample cell and adapter requirements for AccuVac Ampul tests. The tables also show all of the instruments that have the program for this test.

To use the table, select an instrument, then read across to find the applicable information for this test.

**Table 1 Instrument-specific information for reagent addition**

Instrument	Sample cell orientation	Sample cell
DR 6000 DR 3800 DR 2800 DR 2700 DR 1900	The fill line is to the right.	2495402 
DR 5000 DR 3900	The fill line is toward the user.	
DR 900	The orientation mark is toward the user.	2401906 

**Table 2 Instrument-specific information for AccuVac Ampuls**

Instrument	Adapter	Sample cell
DR 6000 DR 5000 DR 900	—	2427606 
DR 3900	LZV846 (A)	
DR 1900	9609900 or 9609800 (C)	
DR 3800 DR 2800 DR 2700	LZV584 (C)	2122800 

## Before starting

Install the instrument cap on the DR 900 cell holder before ZERO or READ is pushed.

The reagent in this test procedure converts all soluble iron and most insoluble forms of iron in the sample to soluble ferrous iron for measurement. For regulatory reporting, however, the sample must be digested with heat and acid to make sure that all forms of the metal are measured.

For the best results, measure the reagent blank value for each new lot of reagent. Replace the sample with deionized water in the test procedure to determine the reagent blank value. Subtract the reagent blank value from the sample results automatically with the reagent blank adjust option.

For turbid samples, treat the blank with one 0.1-g scoop of RoVer Rust Remover. Swirl to dissolve.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

## Items to collect

### Powder pillows

Description	Quantity
FerroVer <sup>®</sup> Iron Reagent Powder Pillows, 10-mL <sup>1</sup>	1
Sample cells. (For information about sample cells, adapters or light shields, refer to <a href="#">Instrument-specific information</a> on page 1.)	2

<sup>1</sup> FerroVer is a registered trademark of Hach Company.

Refer to [Consumables and replacement items](#) on page 7 for order information.

### AccuVac Ampuls

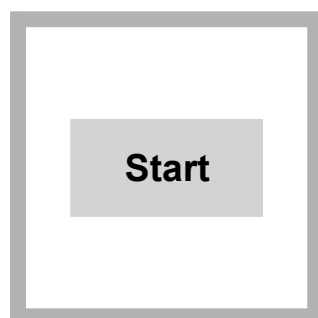
Description	Quantity
FerroVer <sup>®</sup> Iron Reagent AccuVac <sup>®</sup> Ampul	1
Beaker, 50-mL	1
Sample cells (For information about sample cells, adapters or light shields, refer to <a href="#">Instrument-specific information</a> on page 1.)	1
Stopper for 18-mm tubes and AccuVac Ampuls	1

Refer to [Consumables and replacement items](#) on page 7 for order information.

## Sample collection and storage

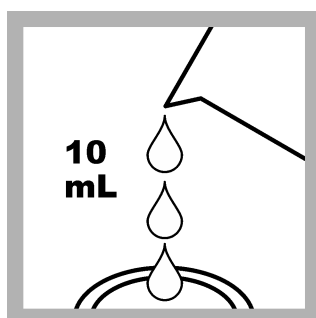
- Collect samples in clean glass or plastic bottles that have been cleaned with 6 N (1:1) hydrochloric acid and rinsed with deionized water.
- To measure only dissolved iron, filter the sample immediately after collection and before acidification.
- To preserve samples for later analysis, adjust the sample pH to less than 2 with concentrated nitric acid (approximately 2 mL per liter). No acid addition is necessary if the sample is tested immediately.
- Keep the preserved samples at room temperature for a maximum of 6 months.
- Before analysis, adjust the pH to 3–5 with 5 N sodium hydroxide solution.
- Correct the test result for the dilution caused by the volume additions.

## Powder pillow procedure

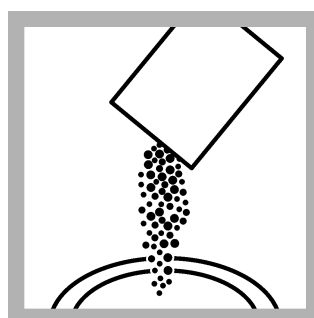


1. Start program **265 Iron, FerroVer**. For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.

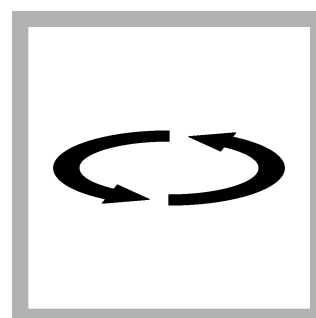
**Note:** Although the program name can be different between instruments, the program number does not change.



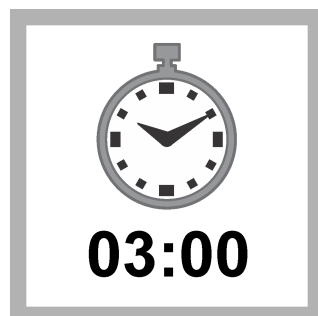
2. **Prepare the sample:** Fill a sample cell with 10 mL of sample.



3. Add the contents of one FerroVer Iron Reagent Powder Pillow to the sample cell.

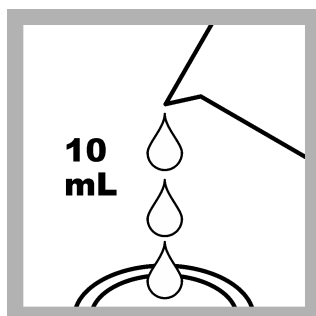


4. Swirl the sample cell to mix. Undissolved powder will not affect accuracy.

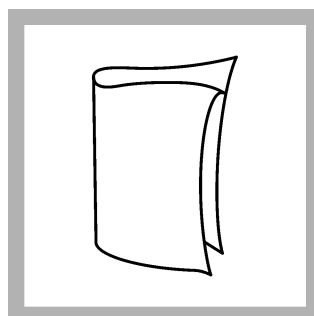


5. Start the instrument timer. A 3-minute reaction time starts.

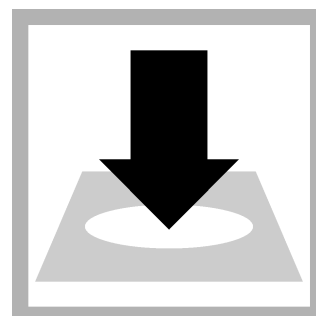
An orange color will show if iron is present. Let samples that contain rust react for 5 minutes or more.



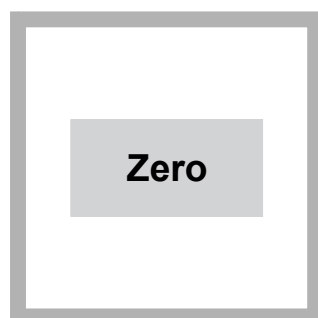
6. **Prepare the blank:** Fill a second sample cell with 10 mL of sample.



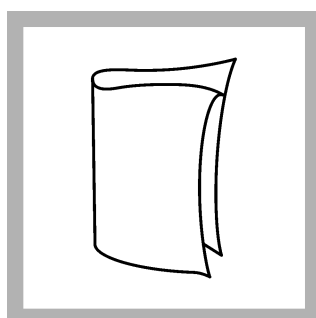
7. Clean the blank sample cell.



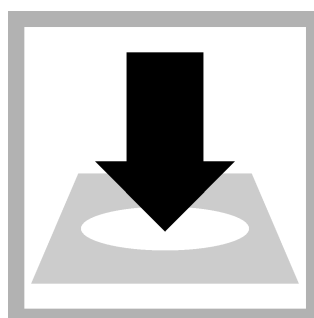
8. When the timer expires, insert the blank into the cell holder.



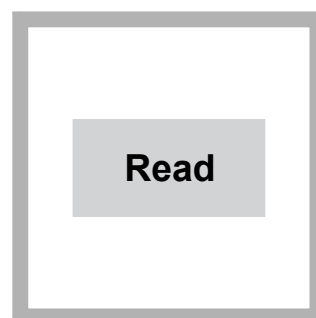
9. Push **ZERO**. The display shows 0.00 mg/L Fe.



10. Clean the prepared sample cell.



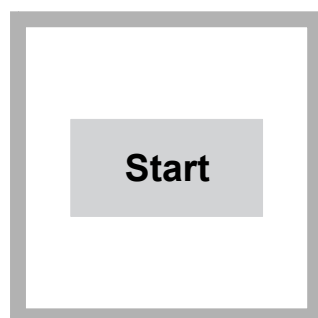
11. Insert the prepared sample into the cell holder.



12. Push **READ**. Results show in mg/L Fe.

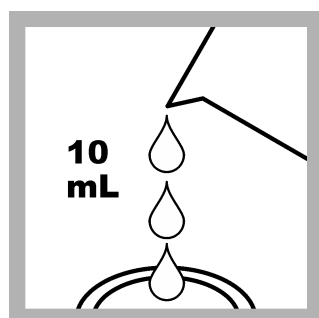


## AccuVac procedure

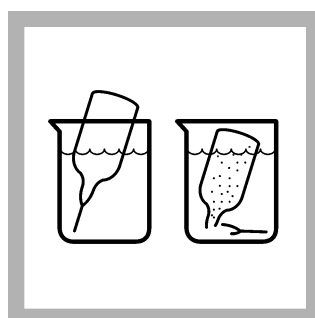


1. Start program **267 Iron, FerroVer AV**. For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.

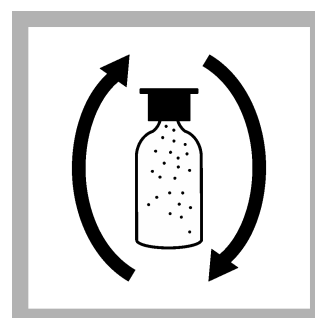
**Note:** Although the program name can be different between instruments, the program number does not change.



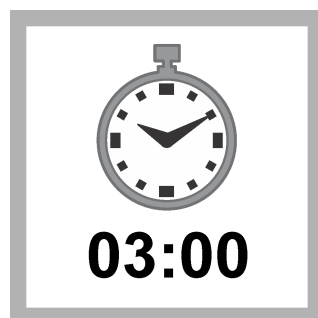
2. **Prepare the blank:** Fill the sample cell with 10 mL of sample.



3. **Prepare the sample:** Collect at least 40 mL of sample in a 50-mL beaker. Fill the AccuVac Ampul with sample. Keep the tip immersed while the AccuVac Ampul fills completely.

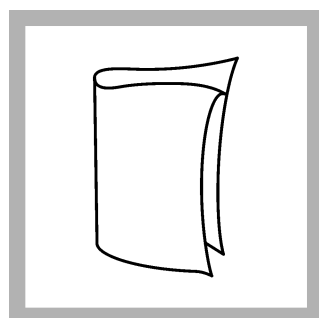


4. Quickly invert the AccuVac Ampul several times to mix. Undissolved powder will not affect accuracy.

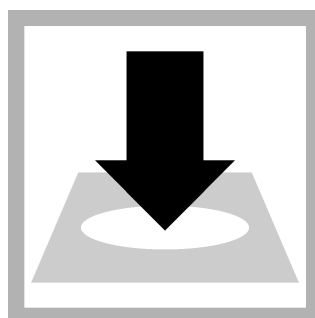


5. Start the instrument timer. A 3-minute reaction time starts.

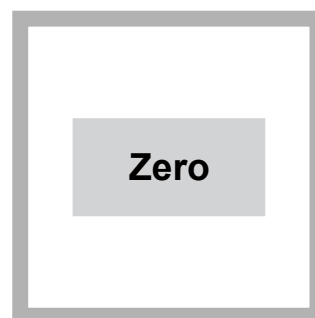
An orange color will show if iron is present. Let samples that contain rust react for 5 minutes or more.



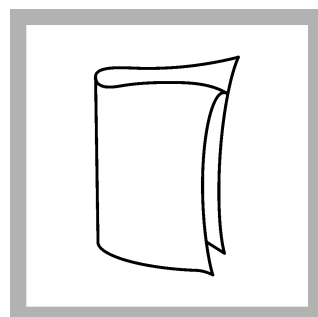
6. Clean the blank sample cell.



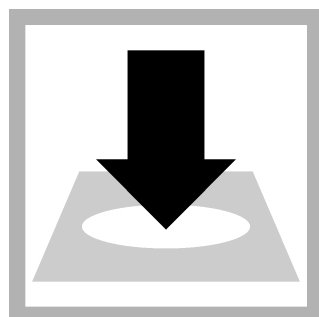
7. When the timer expires, insert the blank into the cell holder.



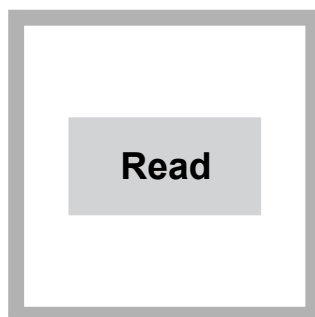
8. Push **ZERO**. The display shows 0.00 mg/L Fe.



9. Clean the AccuVac Ampul.



10. Insert the prepared sample AccuVac Ampul into the cell holder.



11. Push **READ**. Results show in mg/L Fe.

## Interferences

Interfering substance	Interference level
Calcium, $\text{Ca}^{2+}$	No effect at less than 10,000 mg/L as $\text{CaCO}_3$ .
Chloride, $\text{Cl}^-$	No effect at less than 185,000 mg/L.
Copper, $\text{Cu}^{2+}$	No effect. Masking agent is contained in FerroVer Reagent.
High iron levels	Inhibit color development. Dilute sample and re-test to verify results.
Iron oxide	A mild, vigorous or Digesdahl digestion is necessary. After digestion, adjust the sample pH to 3–5 with sodium hydroxide, then analyze.
Magnesium	No effect at 100,000 mg/L as $\text{CaCO}_3$ .
Molybdate molybdenum	No effect at 50 mg/L as Mo.
High sulfide levels, $\text{S}^{2-}$	<p>Pretreat the sample in a fume hood or in an area with sufficient airflow before analysis:</p> <ol style="list-style-type: none"> <li>1. Add 5 mL of 6.0 N (1:1) hydrochloric acid solution to 100 mL of sample in a 250-mL Erlenmeyer flask.</li> <li>2. Boil for 20 minutes.</li> <li>3. Let the solution cool to room temperature.</li> <li>4. Adjust the pH to 3–5 with 5 N sodium hydroxide solution.</li> <li>5. Add deionized water until the volume is 100 mL.</li> <li>6. Use the treated sample in the test procedure.</li> </ol>
Turbidity	<p>Pre-treat the sample before analysis:</p> <ol style="list-style-type: none"> <li>1. Add one 0.1-g scoop of RoVer® Rust Remover to the blank. Swirl to mix.</li> <li>2. If the sample remains turbid, add three 0.2-g scoops of RoVer Rust Remover to 75 mL of sample. Let stand 5 minutes.</li> <li>3. Filter through a 0.45-micron membrane filter and filter holder.</li> <li>4. Use the treated sample in the test procedure.</li> </ol>
Highly buffered samples or extreme sample pH	Can prevent the correct pH adjustment of the sample by the reagents. Sample pre-treatment may be necessary. Adjust the pH to 3–5.

## Accuracy check

### Standard additions method (sample spike)

Use the standard additions method (for applicable instruments) to validate the test procedure, reagents and instrument and to find if there is an interference in the sample.

Items to collect:

- Iron Voluette® Ampule Standard, 25 mg/L
  - Ampule Breaker
  - Pipet, TenSette®, 0.1–1.0 mL and tips
1. Use the test procedure to measure the concentration of the sample, then keep the (unspiked) sample in the instrument.
  2. Go to the Standard Additions option in the instrument menu.
  3. Select the values for standard concentration, sample volume and spike volumes.
  4. Open the standard solution.
  5. Prepare three spiked samples: use the TenSette pipet to add 0.1 mL, 0.2 mL and 0.3 mL of the standard solution, respectively, to three 10-mL portions of fresh sample. Mix well.

**Note:** For AccuVac® Ampuls, add 0.2 mL, 0.4 mL and 0.6 mL of the standard solution to three 50-mL portions of fresh sample.

6. Use the test procedure to measure the concentration of each of the spiked samples. Start with the smallest sample spike. Measure each of the spiked samples in the instrument.
7. Select **Graph** to compare the expected results to the actual results.  
***Note:** If the actual results are significantly different from the expected results, make sure that the sample volumes and sample spikes are measured accurately. The sample volumes and sample spikes that are used should agree with the selections in the standard additions menu. If the results are not within acceptable limits, the sample may contain an interference.*

### Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- Iron standard solution, 100 mg/L
- 100-mL volumetric flask, Class A
- 2-mL volumetric pipet, Class A and pipet filler
- Deionized water

1. Prepare a 2.00-mg/L iron standard solution as follows:
  - a. Use a pipet to add 2 mL of the 100-mg/L iron standard solution into the volumetric flask.
  - b. Dilute to the mark with deionized water. Mix well. Prepare this solution daily.
2. Use the test procedure to measure the concentration of the prepared standard solution.
3. Compare the expected result to the actual result.

***Note:** The factory calibration can be adjusted slightly with the standard adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are slight variations in the reagents or instruments.*

### Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users can get different results under different test conditions.

Program	Standard	Precision (95% Confidence Interval)	Sensitivity Concentration change per 0.010 Abs change
265	2.00 mg/L Fe	1.99–2.01 mg/L Fe	0.021 mg/L Fe
267	2.00 mg/L Fe	1.98–2.02 mg/L Fe	0.023 mg/L Fe

### Summary of method

FerroVer Iron Reagent converts all soluble iron and most insoluble forms of iron in the sample to soluble ferrous iron. The ferrous iron reacts with the 1-10 phenanthroline indicator in the reagent to form an orange color in proportion to the iron concentration. The measurement wavelength is 510 nm for spectrophotometers or 520 nm for colorimeters.

## Consumables and replacement items

### Required reagents

Description	Quantity/Test	Unit	Item no.
FerroVer <sup>®</sup> Iron Reagent Powder Pillow <sup>1</sup> , 10-mL	1	100/pkg	2105769
OR			
FerroVer <sup>®</sup> Iron Reagent AccuVac <sup>®</sup> Ampul	1	25/pkg	2507025

<sup>1</sup> FerroVer is a registered trademark of Hach Company

### Required apparatus

Description	Quantity/Test	Unit	Item no.
Beaker, 50-mL	1	each	50041H
Stoppers for 18-mm tubes and AccuVac Ampuls	2	6/pkg	173106

### Recommended standards and apparatus

Description	Unit	Item no.
Flask, volumetric, Class A, 100-mL glass	each	1457442
Iron Standard Solution, 100-mg/L Fe	100 mL	1417542
Iron Standard Solution, 10-mL Voluette <sup>®</sup> Ampule, 25-mg/L Fe	16/pkg	1425310
Metals Drinking Water Standard, LR for Cu, Fe, Mn	500 mL	2833749
Metals Drinking Water Standard, HR for Cu, Fe, Mn	500 mL	2833649
Pipet filler, safety bulb	each	1465100
Pipet, TenSette <sup>®</sup> , 0.1–1.0 mL	each	1970001
Pipet tips for TenSette <sup>®</sup> Pipet, 0.1–1.0 mL	50/pkg	2185696
Pipet tips for TenSette <sup>®</sup> Pipet, 0.1–1.0 mL	1000/pkg	2185628
Pipet, volumetric, Class A, 2-mL	each	1451536
Water, deionized	4 L	27256

### Optional reagents and apparatus

Description	Unit	Item no.
AccuVac <sup>®</sup> Ampul Snapper	each	2405200
Mixing cylinder, graduated, 50-mL	each	189641
Filter, glass fiber membrane, 1.5-micron, 47-mm	100/pkg	253000
Filter membrane filter holder, 47-mm	each	234000
Hydrochloric Acid, concentrated	500 mL	13449
Nitric Acid, concentrated	500 mL	15249
RoVer Rust Remover	454 g	30001
Sodium Hydroxide Standard Solution, 5.0 N	100 mL MDB	245032
Spoon, measuring, 0.1-g	each	51100



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**HACH COMPANY**

WORLD HEADQUARTERS

Telephone: (970) 669-3050

FAX: (970) 669-2932

# Phosphorus, Reactive (Orthophosphate)

DOC316.53.01113

## Amino Acid Method<sup>1</sup>

0.23 to 30.00 mg/L PO<sub>4</sub><sup>3-</sup>

## Method 8178

## Reagent Solution

**Scope and application:** For water, wastewater and seawater.

<sup>1</sup> Adapted from Standard Methods for the Examination of Water and Wastewater.




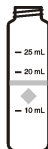
## Test preparation

## Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows sample cell and orientation requirements for reagent addition tests, such as powder pillow or bulk reagent tests.

To use the table, select an instrument, then read across to find the applicable information for this test.

**Table 1 Instrument-specific information**

Instrument	Sample cell orientation	Sample cell
DR 6000 DR 3800 DR 2800 DR 2700 DR 1900	The fill line is to the right.	2495402 
DR 5000 DR 3900	The fill line is toward the user.	
DR 900	The orientation mark is toward the user.	2401906 

## Before starting

Install the instrument cap on the DR 900 cell holder before ZERO or READ is pushed.

For the best results, measure the reagent blank value for each new lot of reagent. Replace the sample with deionized water in the test procedure to determine the reagent blank value. Subtract the reagent blank value from the sample results automatically with the reagent blank adjust option.

The contents of one Amino Acid Reagent Powder Pillow can be used as an alternative to the 1 mL of Amino Acid Reagent Solution in the test procedure.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.



## Items to collect

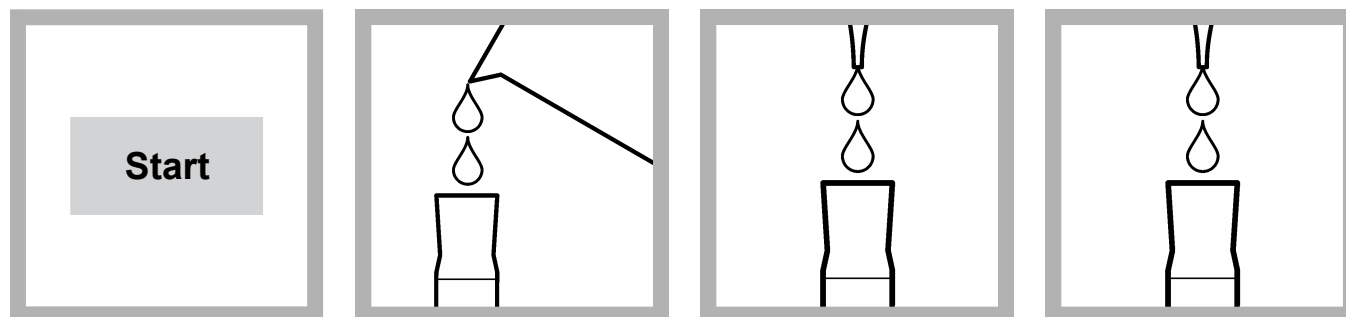
Description	Quantity
Amino Acid Reagent	1 mL
Cylinder, 25-mL, graduated mixing	1
Molybdate Reagent	1 mL
Sample cells (For information about sample cells, adapters or light shields, refer to <a href="#">Instrument-specific information</a> on page 1.)	2

Refer to [Consumables and replacement items](#) on page 5 for order information.

## Sample collection and storage

- Collect samples in clean glass or plastic bottles that have been cleaned with 6 N (1:1) hydrochloric acid and rinsed with deionized water.
- Do not use a detergent that contains phosphate to clean the sample bottles. The phosphate in the detergent will contaminate the sample.
- Analyze the samples as soon as possible for best results.
- If immediate analysis is not possible, immediately filter and keep the samples at or below 6 °C (43 °F) for a maximum of 48 hours.
- Let the sample temperature increase to room temperature before analysis.

## Powder pillow procedure



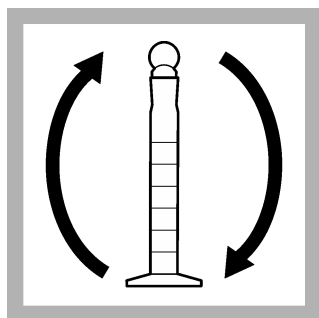
**1. Start program 485 P React. Amino.** For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.

**Note:** Although the program name can be different between instruments, the program number does not change.

**2. Prepare the sample:** Fill a mixing cylinder to the 25-mL line with sample.

**3. Prepare the sample:** Add 1 mL of Molybdate Reagent.

**4. Add 1 mL of Amino Acid Reagent Solution.**



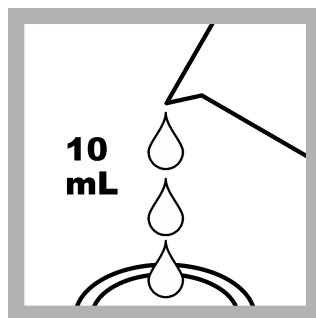
5. Put the stopper on the mixing cylinder. Invert the mixing cylinder several times to mix.

A blue color shows if phosphate is present in the sample.

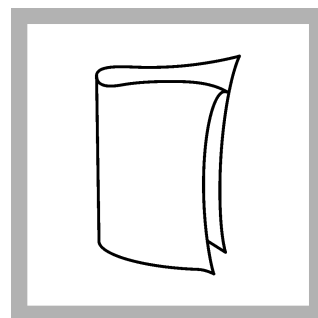


6. Start the instrument timer. A 10-minute reaction time starts.

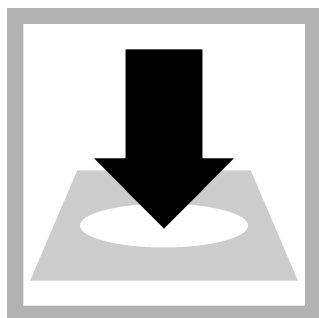
Prepare the blank while the timer is counting down.



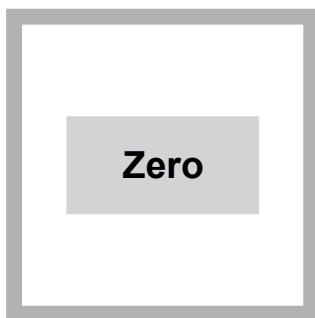
7. **Prepare the blank:** Fill a sample cell with 10 mL of untreated sample.



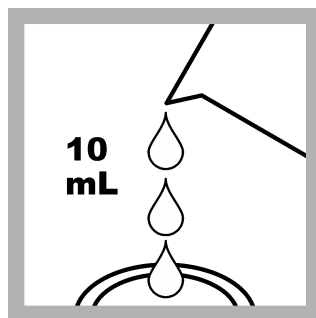
8. When the timer expires, clean the blank sample cell.



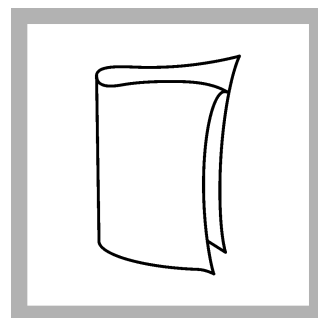
9. Insert the blank into the cell holder.



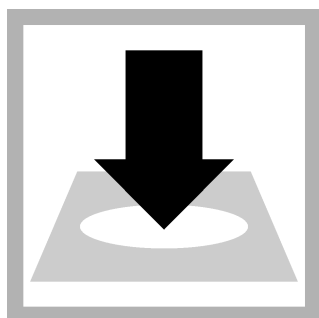
10. Push **ZERO**. The display shows 0.00 mg/L  $\text{PO}_4^{3-}$ .



11. Fill a second sample cell with 10-mL of the prepared sample.



12. Clean the prepared sample cell.



13. Insert the prepared sample into the cell holder.



14. Push **READ**. Results show in mg/L  $\text{PO}_4^{3-}$ .

## Interferences

Interfering substance	Interference level
Calcium	More than 10,000 mg/L as $\text{CaCO}_3$
Chloride	More than 150,000 mg/L $\text{Cl}^-$
Colored samples	Add 1 mL of 10 N Sulfuric Acid Standard Solution to another 25-mL sample. Use this instead of untreated sample as the blank to zero the instrument. Use a pipet and pipet filler to measure the sulfuric acid standard.
High salt levels ( $\text{Na}^+$ )	May cause low results. To eliminate this interference, dilute the sample until two successive dilutions give about the same result.

Interfering substance	Interference level
Magnesium	More than 40,000 mg/L as CaCO <sub>3</sub>
Nitrite (NO <sub>2</sub> <sup>-</sup> )	Bleaches the blue color. Remove nitrite interference by adding 0.10 g of sulfamic acid to 50 mL sample. Swirl to mix. Use this treated sample in the test procedure.
Phosphates, high levels (PO <sub>4</sub> <sup>3-</sup> )	As the concentration of phosphate increases, the color changes from blue to green, then to yellow and finally to brown. The brown color may suggest a concentration as high as 100,000 mg/L PO <sub>4</sub> <sup>3-</sup> . If a color other than blue is formed, dilute the sample and retest.
Sulfide (S <sup>2-</sup> )	Sulfide interferes. For samples with a sulfide concentration less than 5 mg/L, remove sulfide interference as follows: <ol style="list-style-type: none"> <li>1. Add 50 mL of sample to an Erlenmeyer flask.</li> <li>2. Add Bromine Water by drops with constant swirling until a permanent yellow color develops.</li> <li>3. Add Phenol Solution by drops until the yellow color just disappears. Use this treated sample in the test procedure.</li> </ol>
Temperature	For best results, sample temperature should be 21 ± 3 °C (70 ± 5 °F).
Turbidity	May give inconsistent results for two reasons. Some suspended particles may dissolve because of the acid used in the test. Also, desorption of orthophosphate from particles may occur. For highly turbid samples, add 1 mL of 10 N Sulfuric Acid Standard Solution to another 25-mL sample. Use this instead of untreated sample as the blank to zero the instrument. Use a pipet and pipet filler to measure the sulfuric acid standard.
Highly buffered samples or extreme sample pH	Can prevent the correct pH adjustment of the sample by the reagents. Sample pre-treatment may be necessary.

## Accuracy check

### Standard additions method (sample spike)

Use the standard additions method (for applicable instruments) to validate the test procedure, reagents and instrument and to find if there is an interference in the sample.

Items to collect:

- Phosphate 2-mL Ampule Standard, 500-mg/L PO<sub>4</sub><sup>3-</sup>
  - Ampule breaker
  - Pipet, TenSette®, 0.1–1.0 mL and tips
  - Mixing cylinders, 25-mL (3)
1. Use the test procedure to measure the concentration of the sample, then keep the (unspiked) sample in the instrument.
  2. Go to the Standard Additions option in the instrument menu.
  3. Select the values for standard concentration, sample volume and spike volumes.
  4. Open the standard solution.
  5. Prepare three spiked samples: use the TenSette pipet to add 0.1 mL, 0.2 mL and 0.3 mL of the standard solution, respectively, to three 25-mL portions of fresh sample. Mix well.
  6. Use the test procedure to measure the concentration of each of the spiked samples. Start with the smallest sample spike. Measure each of the spiked samples in the instrument.
  7. Select **Graph** to compare the expected results to the actual results.

**Note:** If the actual results are significantly different from the expected results, make sure that the sample volumes and sample spikes are measured accurately. The sample volumes and sample spikes that are used should agree with the selections in the standard additions menu. If the results are not within acceptable limits, the sample may contain an interference.

## Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- 10-mg/L Phosphate Standard Solution
1. Use the test procedure to measure the concentration of the standard solution.
  2. Compare the expected result to the actual result.

**Note:** The factory calibration can be adjusted slightly with the standard adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are slight variations in the reagents or instruments.

## Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users can get different results under different test conditions.

Program	Standard	Precision (95% confidence interval)	Sensitivity Concentration change per 0.010 Abs change
485	10.00 mg/L PO <sub>4</sub> <sup>3-</sup>	9.86–10.14 mg/L PO <sub>4</sub> <sup>3-</sup>	0.20 mg/L PO <sub>4</sub> <sup>3-</sup>

## Summary of method

In a highly acidic solution, ammonium molybdate reacts with orthophosphate to form molybdophosphoric acid. This complex is then reduced by the amino acid reagent to yield an intensely colored molybdenum blue compound. The measurement wavelength is 530 nm for spectrophotometers or 520 nm for colorimeters.

## Consumables and replacement items

### Required reagents

Description	Quantity/test	Unit	Item no.
High Range Reactive Phosphorus Reagent Set	—	100 tests	2244100
Includes:			
Amino Acid Reagent	1 mL	100 mL MDB	193432
Molybdate Reagent	1 mL	100 mL MDB	223632

### Required apparatus

Description	Quantity/test	Unit	Item no.
Mixing cylinder, graduated, 25-mL, glass stopper	1	each	189640

### Recommended standards and apparatus

Description	Unit	Item no.
Phosphate Standard Solution, 10-mg/L as PO <sub>4</sub>	946 mL	1420416
Phosphate Standard Solution, 2-mL PourRite® Ampule, 500-mg/L PO <sub>4</sub> <sup>3-</sup>	16/pkg	1424220
Wastewater Effluent Standard Solution, Mixed Parameter, for NH <sub>3</sub> -N, NO <sub>3</sub> -N, PO <sub>4</sub> <sup>3-</sup> , COD, SO <sub>4</sub> <sup>2-</sup> , TOC	500 mL	2833249
Wastewater Influent Standard Solution, Mixed Parameter, for NH <sub>3</sub> -N, NO <sub>3</sub> -N, PO <sub>4</sub> , COD, SO <sub>4</sub> , TOC	500 mL	2833149

**Recommended standards and apparatus (continued)**

Description	Unit	Item no.
Water, deionized	4 L	27256
Ampule Breaker, 2-mL PourRite® Ampules	each	2484600

**Optional reagents and apparatus**

Description	Unit	Item no.
Amino Acid Reagent Powder Pillows	100/pkg	80499
Bromine Water, 30 g/L	29 mL	221120
Flask, Erlenmeyer, 125-mL	each	50543
Hydrochloric Acid Solution, 6.0 N (1:1)	500 mL	88449
Phenol Solution, 30-g/L	29 mL	211220
Sulfamic Acid, 454 g	each	234401
Sulfuric Acid Standard Solution, 10 N	1000 mL	93153
Pipet, TenSette®, 0.1–1.0 mL	each	1970001
Pipet tips for TenSette® Pipet, 0.1–1.0 mL	50/pkg	2185696
Pipet tips for TenSette® Pipet, 0.1–1.0 mL	1000/pkg	2185628
Paper, pH, 0–14 pH range	100/pkg	2601300
Filter paper, folded, 3–5-micron, 12.5-cm	100/pkg	69257
Funnel, poly, 65-mm	each	108367
Thermometer, non-mercury, –10 to +225 °C	each	2635700
Bottle, sampling, with cap, low density polyethylene, 250-mL	12/pkg	2087076

**Optional standards**

Description	Unit	Item no.
Ampule Breaker, 10-mL Voluette® Ampules	each	2196800
Phosphate Standard Solution, 3-mg/L as PO <sub>4</sub> <sup>3-</sup>	946 mL	2059716
Phosphate Standard Solution, 15-mg/L as PO <sub>4</sub> <sup>3-</sup>	100 mL	1424342
Phosphate Standard Solution, 30-mg/L as PO <sub>4</sub> <sup>3-</sup>	946 mL	1436716
Phosphate Standard Solution, 50-mg/L, 10-mL Voluette® Ampules	16/pkg	17110
Phosphate Standard Solution, 100-mg/L as PO <sub>4</sub>	100 mL	1436832
Phosphate Standard Solution, 10-mL ampule, 500 mg/L as PO <sub>4</sub>	16/pkg	1424210
Phosphate Standard Solution, 500-mg/L as PO <sub>4</sub>	100 mL	1424232



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USEPA<sup>1</sup> SulfaVer 4 Method<sup>2</sup>2 to 70 mg/L SO<sub>4</sub><sup>2-</sup>

Method 8051


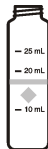
Powder Pillows

**Scope and application:** For water, wastewater and seawater.<sup>1</sup> USEPA accepted for reporting wastewater analyses. Procedure is equivalent to USEPA method 375.4 for wastewater.<sup>2</sup> Adapted from *Standard Methods for the Examination of Water and Wastewater*, SM4500-SO<sub>4</sub><sup>2-</sup>-E.**Test preparation****Instrument-specific information**

[Table 1](#) shows all of the instruments that have the program for this test. The table also shows sample cell and orientation requirements for reagent addition tests, such as powder pillow or bulk reagent tests.

To use the table, select an instrument, then read across to find the applicable information for this test.

**Table 1 Instrument-specific information**

Instrument	Sample cell orientation	Sample cell
DR6000 DR3800 DR2800 DR2700 DR1900	The fill line is to the right.	2495402 
DR5000 DR3900	The fill line is toward the user.	
DR900	The orientation mark is toward the user.	2401906 

**Before starting**

For turbidimetric methods, install the instrument cap or cover on all instruments before ZERO or READ is pushed.

Use the Standard Adjust option with each new lot of reagent for the best results. Refer to the Standard solution method in [Accuracy check](#) on page 3.

For best results, calibrate the instrument with each new lot of reagent. Refer to [Calibration](#) on page 4.

For the best results, measure the reagent blank value for each new lot of reagent. Replace the sample with deionized water in the test procedure to determine the reagent blank value. Subtract the reagent blank value from the sample results automatically with the reagent blank adjust option.

Filter samples that are turbid with filter paper and a funnel.

Do not use the Pour-Thru Cell or sipper module (for applicable instruments) with this test.

The reagents that are used in this test contain barium chloride. Collect the reacted samples for safe disposal.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

## Items to collect

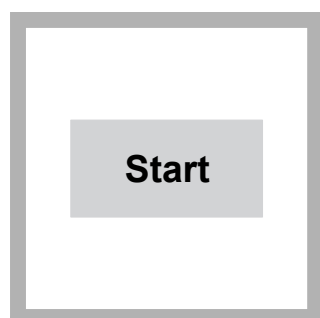
Description	Quantity
SulfaVer <sup>®</sup> 4 Reagent Powder Pillows, 10-mL	1
Sample Cells (Refer to <a href="#">Instrument-specific information</a> on page 1. )	2

Refer to [Consumables and replacement items](#) on page 5 for order information.

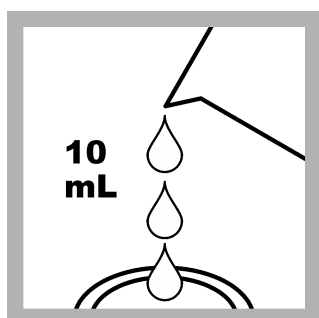
## Sample collection and storage

- Collect samples in clean glass or plastic bottles.
- To preserve samples for later analysis, keep the samples at or below 6 °C (43 °F) for up to 28 days.
- Let the sample temperature increase to room temperature before analysis.

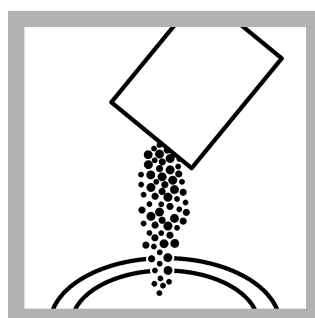
## Powder pillow procedure



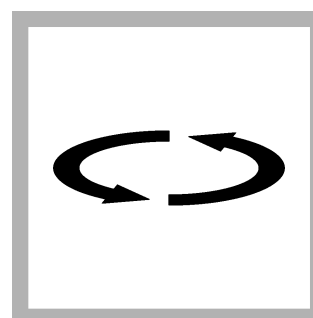
**1. Start program 680 Sulfate.** For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.



**2. Prepare the sample:** Fill a sample cell with 10 mL of sample.



**3.** Add the contents of one SulfaVer 4 powder pillow to the sample cell.

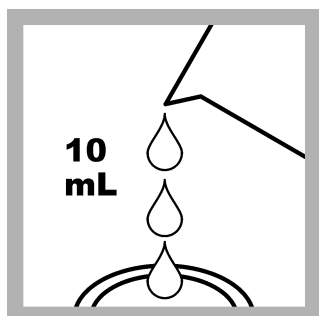


**4.** Swirl the sample cell to mix. Undissolved powder will not affect accuracy. White turbidity will form if sulfate is present.

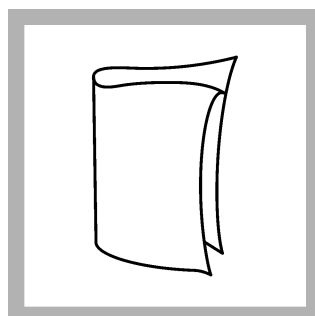


**5.** Start the instrument timer. A 5-minute reaction time starts.

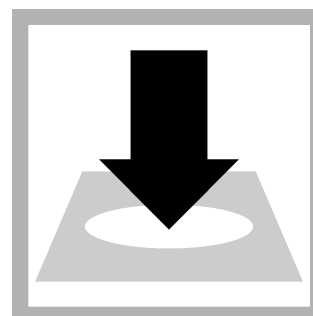
Do not disturb the cell during this time.



**6. Prepare the blank:** Fill a second sample cell with 10 mL of sample.

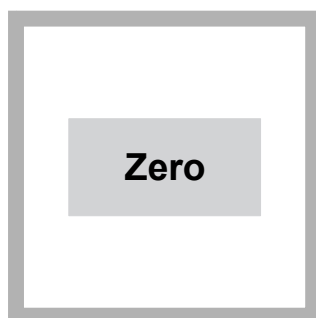


**7.** When the timer expires, clean the blank sample cell.

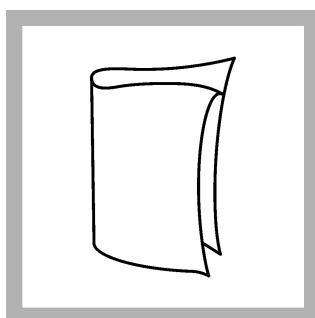


**8.** Insert the blank into the cell holder.

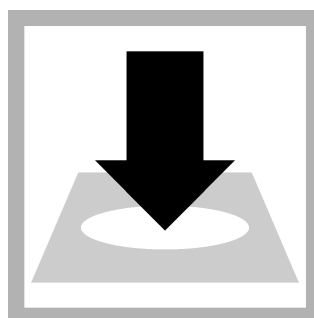




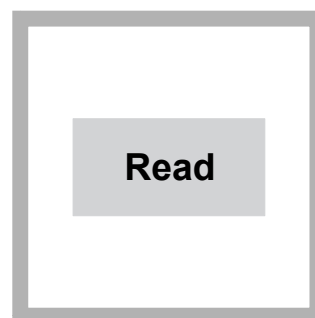
**9. Push ZERO.** The display shows 0 mg/L  $\text{SO}_4^{2-}$ .



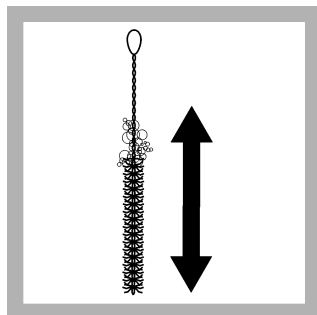
**10. Clean** the prepared sample cell.



**11. Within 5 minutes** after the timer expires, insert the prepared sample into the cell holder.



**12. Push READ.** Results show in mg/L  $\text{SO}_4^{2-}$ .



**13. Clean** the sample cells with soap and a brush.

## Interferences

Interfering substance	Interference level
Barium	Interferes at all levels. The higher the relative barium concentration when compared to the sulfate concentration, the higher the error. Samples with high barium concentrations will generally give a result that is 20% lower than the actual sulfate concentration.
Calcium	More than 20,000 mg/L as $\text{CaCO}_3$
Chloride	More than 40,000 mg/L as $\text{Cl}^-$
Magnesium	More than 10,000 mg/L as $\text{CaCO}_3$
Silica	More than 500 mg/L $\text{SiO}_2$

## Accuracy check

### Standard additions method (sample spike)

Use the standard additions method (for applicable instruments) to validate the test procedure, reagents and instrument and to find if there is an interference in the sample.

Items to collect:

- Sulfate Ampule Standard Solution, 2500 mg/L sulfate
- Ampule breaker
- Pipet, TenSette®, 0.1–1.0 mL and tips
- Mixing cylinders (3x), 25-mL

1. Use the test procedure to measure the concentration of the sample, then keep the (unspiked) sample in the instrument.
2. Go to the Standard Additions option in the instrument menu.
3. Select the values for standard concentration, sample volume and spike volumes.

4. Open the standard solution.
5. Prepare three spiked samples: use the TenSette pipet to add 0.1 mL, 0.2 mL and 0.3 mL of the standard solution, respectively, to three 25-mL portions of fresh sample. Mix well.
6. Use the test procedure to measure the concentration of each of the spiked samples. Start with the smallest sample spike. Measure each of the spiked samples in the instrument.
7. Select **Graph** to compare the expected results to the actual results.

**Note:** If the actual results are significantly different from the expected results, make sure that the sample volumes and sample spikes are measured accurately. The sample volumes and sample spikes that are used should agree with the selections in the standard additions menu. If the results are not within acceptable limits, the sample may contain an interference.

### Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- Sulfate standard solution, 1000-mg/L
- 100-mL volumetric flask, Class A
- 7-mL volumetric pipet, Class A and pipet filler safety bulb
- Deionized water

1. Prepare a 70-mg/L sulfate standard solution as follows:
  - a. Use a pipet to add 7.0 mL of 1000-mg/L sulfate standard solution into the volumetric flask.
  - b. Dilute to the mark with deionized water. Mix well. Prepare this solution daily.
2. Use the test procedure to measure the concentration of the prepared standard solution.
3. Compare the expected result to the actual result.

**Note:** The factory calibration can be adjusted slightly with the standard adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are small variations in the reagents or instruments.

### Calibration

A calibration is recommended for the SulfaVer 4 method for the best accuracy. Complete the steps that follow to enter a new calibration curve in the instrument. Make a new calibration curve for each new lot of reagent.

Items to collect:

- Sulfate standard solution, 1000 mg/L
  - 100-mL volumetric flasks (7), Class A
  - 1–10 mL TenSette pipet and tips
  - Deionized water
1. Prepare seven calibration standard solutions (10, 20, 30, 40, 50, 60 and 70 mg/L  $\text{SO}_4^{2-}$ ) as follows:
    - a. Use a pipet to add 1, 2, 3, 4, 5, 6 and 7 mL of the 1000-mg/L sulfate standard solution into seven different 100-mL volumetric flasks.
    - b. Dilute each flask to the mark with deionized water. Mix well.
  2. Use the test procedure to measure the concentration of each standard solution.
  3. Refer to the user manual for the instrument to enter the calibration into the instrument as a user program.

## Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users can get different results under different test conditions.

Program	Standard	Precision (95% confidence interval)	Sensitivity Concentration change per 0.010 Abs change
680	40 mg/L $\text{SO}_4^{2-}$	30–50 mg/L $\text{SO}_4^{2-}$	0.4 mg/L $\text{SO}_4^{2-}$

## Summary of method

Sulfate ions in the sample react with barium in the SulfaVer 4 Reagent and form a precipitate of barium sulfate. The amount of turbidity formed is proportional to the sulfate concentration. The measurement wavelength is 450 nm for spectrophotometers or 520 nm for colorimeters.

## Pollution prevention and waste management

Reacted samples contain barium and must be disposed of as a hazardous waste. Dispose of reacted solutions according to local, state and federal regulations.

## Consumables and replacement items

### Required reagents

Description	Quantity/test	Unit	Item no.
SulfaVer <sup>®</sup> 4 Reagent Powder Pillow <sup>1</sup> , 10-mL	1	100/pkg	2106769

### Required apparatus

Description	Quantity/test	Unit	Item no.
Sample cells, 10-20-25-mL, with cap	2	6/pkg	2401906
Sample cells, 10-mL square, matched pair	2	2/pkg	2495402

### Recommended standards

Description	Unit	Item no.
Sulfate Standard Solution, 1000-mg/L as $\text{SO}_4^{2-}$	500 mL	2175749
Sulfate Standard Solution, 2500-mg/L, 10-mL ampules as $\text{SO}_4^{2-}$	16/pkg	1425210
Drinking Water Standard, Mixed Parameter, Inorganic for $\text{F}^-$ , $\text{NO}_3\text{-N}$ , $\text{PO}_4^{3-}$ , $\text{SO}_4^{2-}$	500 mL	2833049

### Optional reagents and apparatus

Description	Unit	Item no.
Mixing cylinder, graduated, 25 mL	each	189640
Mixing cylinder, graduated, 50 mL	each	189641
Ampule Breaker, 10-mL Voluette <sup>®</sup> Ampules	each	2196800
Pipet, TenSette <sup>®</sup> , 0.1–1.0 mL	each	1970001
Pipet tips for TenSette <sup>®</sup> Pipet, 0.1–1.0 mL	50/pkg	2185696
Pipet, TenSette <sup>®</sup> , 1.0–10.0 mL	each	1970010
Pipet tips for TenSette <sup>®</sup> Pipet, 1.0–10.0 mL	50/pkg	2199796
Flask, volumetric, Class A, 100 mL, glass	each	1457442

<sup>1</sup> SulfaVer is a registered trademark of Hach Company.



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USEPA<sup>1</sup> Methylene Blue Method<sup>2</sup>

## Method 8131

5 to 800 µg/L S<sup>2-</sup> (spectrophotometers)

## Reagent Solution

0.01 to 0.70 mg/L S<sup>2-</sup> (colorimeters)

**Scope and application:** For testing total sulfides, H<sub>2</sub>S, HS<sup>-</sup>, and certain metal sulfides in groundwater, wastewater, brines and seawater.

<sup>1</sup> USEPA accepted for reporting wastewater analysis. Procedure is equivalent to Standard Method 4500-S<sup>2-</sup> D.

<sup>2</sup> Adapted from Standard Methods for the Examination of Water and Wastewater.




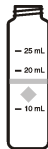
## Test preparation

## Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows sample cell and orientation requirements for reagent addition tests, such as powder pillow or bulk reagent tests.

To use the table, select an instrument, then read across to find the applicable information for this test.

Table 1 Instrument-specific information

Instrument	Sample cell orientation	Sample cell
DR 6000 DR 3800 DR 2800 DR 2700 DR 1900	The fill line is to the right.	2495402 
DR 5000 DR 3900	The fill line is toward the user.	
DR 900	The orientation mark is toward the user.	2401906 

## Before starting

Samples must be analyzed immediately after collection and cannot be preserved for later analysis.

Install the instrument cap on the DR 900 cell holder before ZERO or READ is pushed.

Some sulfide loss can occur if dilution is necessary.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

## Items to collect

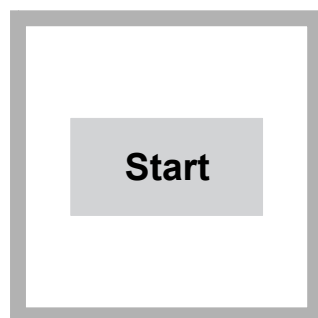
Description	Quantity
Sulfide 1 Reagent	1–2 mL
Sulfide 2 Reagent	1–2 mL
Water, deionized	10–25 mL
Pipet, serological, 10-mL	1
Pipet Filler, safety bulb	1
Sample cells (For information about sample cells, adapters or light shields, refer to <a href="#">Instrument-specific information</a> on page 1.)	2
Stoppers	2

Refer to [Consumables and replacement items](#) on page 5 for order information.

## Sample collection

- Analyze the samples immediately. The samples cannot be preserved for later analysis.
- Collect samples in clean glass or plastic bottles with tight-fitting caps. Completely fill the bottle and immediately tighten the cap.
- Prevent agitation of the sample and exposure to air.

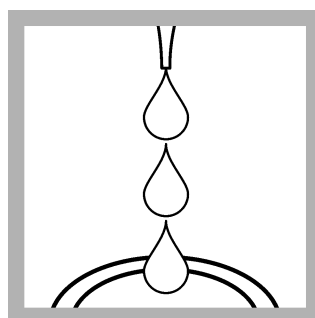
## Reagent solution procedure



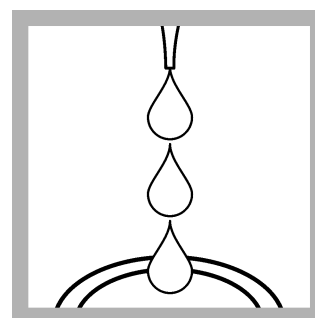
**1. Start program 690 Sulfide.** For information about sample cells, adapters or light shields, refer to [Instrument-specific information](#) on page 1.



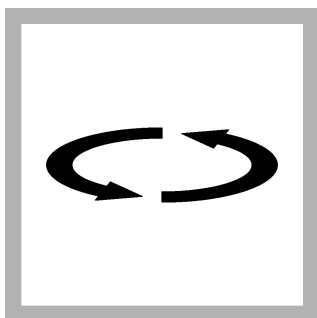
**2. Prepare the blank:** Fill a sample cell with deionized water. Use 10 mL for spectrophotometers and 25 mL for colorimeters.



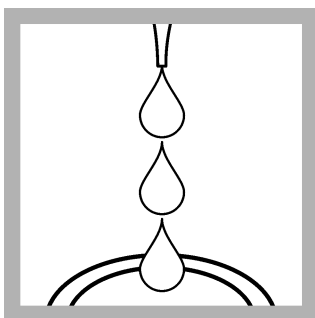
**3. Prepare the sample:** Use a pipet to add sample to a second sample cell. Use 10 mL for spectrophotometers and 25 mL for colorimeters. Do not mix the sample more than necessary to prevent sulfide loss.



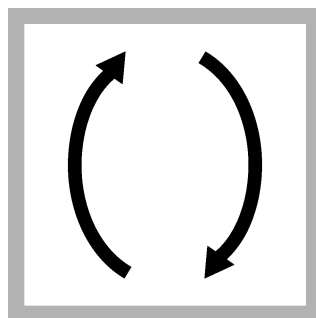
**4. Add Sulfide 1 Reagent to each sample cell.** Use 0.5 mL for spectrophotometers and 1.0 mL for colorimeters.



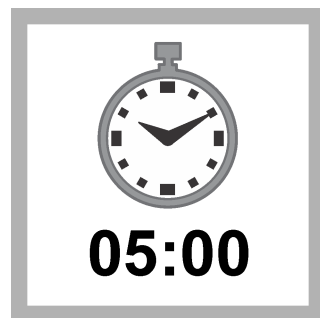
5. Swirl to mix.



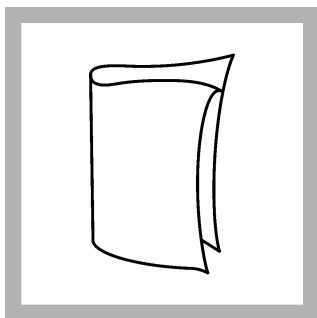
6. Add Sulfide 2 Reagent to each sample cell. Use 0.5 mL for spectrophotometers and 1.0 mL for colorimeters.



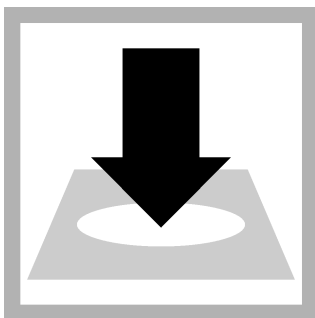
7. Close the sample cell. Invert the sample cell to mix. A pink color will develop initially. If sulfide is present, the solution becomes blue.



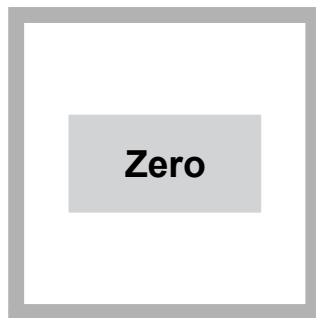
8. Start the instrument timer. A five-minute reaction time starts.



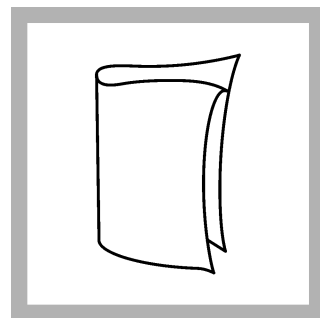
9. When the timer expires, clean the blank sample cell.



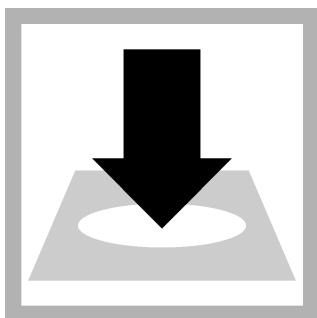
10. Insert the blank into the cell holder.



11. Push **ZERO**. The display shows 0  $\mu\text{g/L}$  or 0.00  $\text{mg/L S}^{2-}$ .



12. Clean the prepared sample cell.



13. Insert the prepared sample into the cell holder.



14. Push **READ**. Results show in  $\mu\text{g/L}$  or  $\text{mg/L S}^{2-}$ .

## Soluble sulfides

To measure soluble sulfides, use a centrifuge to separate the solids. To make an estimate of the amount of insoluble sulfides in the sample, subtract the soluble sulfide concentration from the total (with solids) sulfide concentration.

1. Fill a centrifuge tube completely with sample and immediately cap the tube.
2. Put the tube in a centrifuge and run the centrifuge to separate the solids.
3. Use the supernatant as the sample in the test procedure.



## Interferences

Interfering substance	Interference level
Barium	Concentrations more than 20 mg/L barium react with the sulfuric acid in Sulfide 1 Reagent and form a BaSO <sub>4</sub> (barite) precipitate. To correct for this interference: <ol style="list-style-type: none"><li>1. Dilute the sample in the test procedure as follows:<ul style="list-style-type: none"><li>• Spectrophotometers: use a 0.1-mL or 1.0-mL sample volume and add deionized water to the 10-mL mark.</li><li>• Colorimeters: use a 0.25-mL or 2.5-mL sample volume and add deionized water to the 25-mL mark.</li></ul></li><li>2. Add both Sulfide 1 and Sulfide 2 reagents per the procedure steps.</li><li>3. After the 5-minute reaction period, pour the sample into a 50-mL beaker.</li><li>4. Pull the sample into a Luer-Lock syringe (10 cc for spectrophotometers or 60 cc for colorimeters).</li><li>5. Put a 0.45-µm filter disc on the Luer-Lock tip and filter the sample into a clean sample cell for measurement. Use deionized water to prepare the blank.</li><li>6. Set the instrument zero and read the result, per the procedure steps.</li><li>7. Multiply by the appropriate dilution factor for the dilution used (10 or 100).</li></ol>
Strong reducing substances such as sulfite, thiosulfate and hydrosulfite	Prevent the full color development or reduce the blue color
Sulfide, high levels	High concentrations of sulfide can inhibit the full color development. Use a diluted sample in the test procedure. Some sulfide loss can occur when the sample is diluted.
Turbidity	Pre-treat the sample to remove sulfide, then use the pre-treated sample as the blank in the test procedure. Prepare a sulfide-free blank as follows: <ol style="list-style-type: none"><li>1. Measure 25 mL of sample into a 50-mL Erlenmeyer flask.</li><li>2. Add 30-g/L Bromine Water by drops with constant swirling until a yellow color remains.</li><li>3. Add 30-g/L Phenol Solution by drops with constant swirling until the yellow color is removed.</li><li>4. Use this solution to replace the deionized water blank in the test procedure.</li></ol>

## Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users can get different results under different test conditions.

Program	Standard	Precision (95% confidence interval)	Sensitivity Concentration change per 0.010 Abs change
690	520 µg/L S <sup>2-</sup>	504–536 µg/L S <sup>2-</sup>	5 µg/L S <sup>2-</sup>

## Summary of method

Hydrogen sulfide and acid-soluble metal sulfides react with N,N-dimethyl-p-phenylenediamine sulfate to form methylene blue. The intensity of the blue color is proportional to the sulfide concentration. High sulfide levels in oil field waters may be determined after proper dilution. The measurement wavelength is 665 nm for spectrophotometers or 610 nm for colorimeters.

## Pollution prevention and waste management

Reacted samples contain hexavalent chromium and must be disposed of as a hazardous waste. Dispose of reacted solutions according to local, state and federal regulations.

## Consumables and replacement items

### Required reagents

Description	Quantity/test	Unit	Item no.
Water, deionized	varies	4 L	27256
Sulfide Reagent Set	—	—	2244500
Includes:			
Sulfide 1 Reagent	1–2 mL	100 mL MDB	181632
Sulfide 2 Reagent	1–2 mL	100 mL MDB	181732

### Required apparatus

Description	Quantity/test	Unit	Item no.
Pipet, serological, graduated, 10 mL	1	each	53238
Pipet filler, safety bulb	1	each	1465100
Stoppers for 18-mm tubes and AccuVac Ampuls	2	6/pkg	173106

### Optional reagents and apparatus

Description	Unit	Item no.
Bromine Water, 30-g/L	29 mL	221120
Phenol Solution, 30-g/L	29 mL	211220
Stoppers for 18-mm tube	25/pkg	173125
Flask, Erlenmeyer, 50 mL	each	50541



**FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:**

In the U.S.A. – Call toll-free 800-227-4224

Outside the U.S.A. – Contact the HACH office or distributor serving you.

On the Worldwide Web – [www.hach.com](http://www.hach.com); E-mail – [techhelp@hach.com](mailto:techhelp@hach.com)

**HACH COMPANY**  
WORLD HEADQUARTERS  
Telephone: (970) 669-3050  
FAX: (970) 669-2932

**APPENDIX C**

**PILOT STUDY INJECTION FORMS**

**APPENDIX C**

**PILOT STUDY INJECTION FORMS**

**Table C-1  
Batch Log  
AOI 7, MHIC**

Start Date \_\_\_\_\_

## Crew

Date	Time	Batch	Area	Volume of Permanganate	Water Volume	Note
mm/dd	hh:mm	#		Drums	gallons	
Totals		0		0	0	

**Table C-2**  
**Injection Record**  
**AOI 7, MHIC**

Start Date \_\_\_\_\_

Start Time \_\_\_\_\_

**Langan Crew**

Injection Area \_\_\_\_\_

End Time \_\_\_\_\_

Well / Point \_\_\_\_\_

**Total Volume**  
**(gallons)**

\_\_\_\_\_

[illegible]

**Notes:**

psi - pounds per square inch

ft bgs - feet below ground surface



**Table C-3  
Monitoring Well Log  
AOI 7, MHIC**

**Sanborn Head  
and Associates  
Crew**

**Date** \_\_\_\_\_

**Injection Area** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Well	Time hh:mm	GW Level ft bgs	pH S.U.	Temperature C	Conductivity mS/cm	ORP mv	DO mg/L	Note

**Notes:**  
psi - pounds per square inch  
ft bgs - feet below groundsurface

## **Appendix B**

### **Soil Boring and Well Construction Logs**



Project: Evergreen/Marcus Hook  
Industrial Complex  
Location: Marcus Hook, PA  
Project No.: 4862.04

## Log of Boring AO17-BH-22-001

Ground Elevation: 10.80 ft AMSL

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:



Foreman: P. Wolff

Date Started: 04/04/22

Logged By: L. Tintle

Date Finished: 04/05/22

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Remarks
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description		
0	S-1	0 - 6		---	0.0		-----0'-----	S-1 (0 to 6'): Firm, gray/black, Clayey SILT, some Gravel, few Rock fragments. Moist. FILL.	Petroleum-like odor.
2							CLAYEY SILT		
4									
6									
8									
10									
6	S-2	6 - 10		---	1.8 3.7 3.4 1.4 1.6 2.2 0.19 1.5	-----6'-----	S-2A (6 to 7.8'): Firm, dark gray/black, Silty CLAY, trace organics. Moist.		
8						SILTY CLAY	S-2B (7.8 to 10'): Firm, brown, Silty CLAY with some gravel. Moist		
10									
12									
14									
16									
10	S-3	10 - 15		---	0.7 0.4 1.1 0.5 0.5 0.4 0.3 0.2 0.0	-----11'-----	S-2C (10 to 11'): Firm, light brown, Silty CLAY. Moist		
12							S-3A (11 to 13.5'): Firm, gray/brown, Clayey SILT, with rock fragments. Moist.		
14									
16									
18									
20									
12	S-4	15 - 20		---	2.4 10.9 6.1 2.0 17.3 0.0		S-4A (13.5 to 18'): Soft, brown, Clayey SILT. Moist.		
14									
16									
18									
20									
18	S-5	20 - 25		---	0.5 0.9 3.6 1.4 3.0 19.9 2.0 5.3 4.1			S-5A (18 to 24'): Firm, gray/brown, Clayey SILT, with rock fragments. Moist.	
20									
22									
24									
26									

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4¼" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:


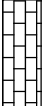
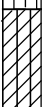
Foreman: P. Wolff Date

Started: 04/04/22

Date Finished: 04/05/22

Logged By: C. Shepsko

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Remarks
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description		
26	S-6	25 - 30		---	22.2 0.8 2.1 1.6 6.3 3.3 4.6 24.8 23.6 23.4	  	-----26'----- SILTY CLAY -----28'----- CLAYEY SILT -----30'-----	S-6A (24 to 26'): Soft, gray/brown, Clayey SILT. Moist.  S-6B (26 to 28'): Firm, dark brown, Silty CLAY. Moist.  S-6C (28 to 30'): Soft, gray/brown, Clayey SILT. Moist.  Boring terminated at 30 feet. No refusal encountered.	
28									
30									
32									
34									
36									
38									
40									
42									
44									
46									
48									
50									

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

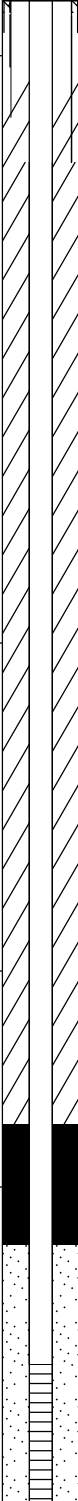
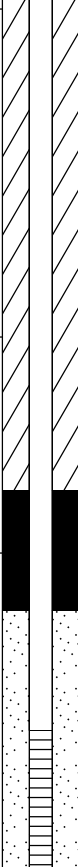
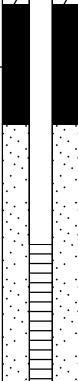
Foreman: P. Wolff

Date Started: 05/11/22

Date Finished: 05/11/22

Logged By: C. Shepsko

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
0	S-1	0 - 6		---	0.0		-----0'-----	S-1 (0 to 6'): S-1 (0 to 6'): Soft, brown, Clayey SILT with gravel rock fragments. Moist. FILL.		6" Dia. Protective Steel Casing with Locking Cover (-3.6 to 0') 2" Dia. Sch. 40 PVC Riser (-3.6 to 20')
2					0.1					
4					0.1					
6	S-2	6 - 10		---	0.0			S-2A (6 to 10'): Soft, brown, Clayey SILT with wood pieces and gravel rock fragments. Wet. FILL.		
8										
10	S-3	10 - 15		---	0.0		-----10'-----	S-2B (8 to 10'): Soft, gray/black, Clayey SILT and Gravel, few Wood chips. Wet. S-3 (10 to 15.5'): Soft, black, Silty SAND. Wet.		Grout (0 to 16')
12								SILTY SAND		
14										
16	S-4	15 - 20		---	0.0		-----15.5'-----	S-4A (15.5 to 17'): Soft, black, CLAY. Moist.		
18								CLAY S-4B (17 to 18'): No recovery. S-4C (18 to 19'): Soft, black, CLAY. Moist.		
20	S-5	20 - 25		---	0.0		-----19'-----	S-5 (19 to 29'): Soft, gray/black, Silty CLAY and Sand. Wet.		Bentonite Chips (16 to 18') 2" Dia. Sch. 20 PVC Well Screen (0.010" Slots) (20 to 29.8')
22								SILTY CLAY		
24										



Project: Evergreen/Marcus Hook  
Industrial Complex  
Location: Marcus Hook, PA  
Project No.: 4862.04

## Log of Monitoring Well MW-559D

Ground Elevation: 9.10 ft AMSL

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:


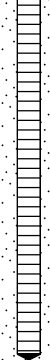

Foreman: P. Wolff

Date Started: 05/11/22

Date Finished: 05/11/22

Logged By: C. Shepsko

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
26	S-6	25 - 30		---	0.0		SILTY CLAY			#1 Filter Sand (18 to 30')
28										
30							SILTY SAND	S-6 (29 to 30'): Soft, gray, Silty SAND. Wet.		
32								Boring terminated at 30 feet. No refusal encountered.		
34										
36										
38										
40										
42										
44										
46										
48										

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

Foreman: P. Wolff

Date Started: 05/11/22

Date Finished: 05/11/22

Logged By: C. Shepsko

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
0	S-1	0 - 6	---	---	0.0		----	S-1 (0 to 6'): Soft, gray/brown, SILT, with some gravel and rock fragments. Moist. FILL.		6" Dia. Protective Steel Casing with Locking Cover (-4.1 to 0')
2							FILL			2" Dia. Sch. 40 PVC Riser (-4.1 to 20')
4										
6	S-2	6 - 10	---	---	0.0		----	S-2 (6 to 11.5'): Soft, gray/brown, Silty SAND with some clay. Wet.		
8							SILTY SAND			
10	S-3	10 - 15	---	---	0.0			S-3A (11.5 to 14'): Soft, gray, Silty SAND. Wet.		Grout (0 to 16')
12					0.2					
14					0.2					
16					0.1					
18					0.1					
20					0.1					
22					0.1					
24										
14					0.0		----	S-3B (14 to 15'): Firm, gray, CLAY. Moist.		
16	S-4	15 - 20	---	---	0.0		----	S-4A (15 to 17.5'): Soft, gray/brown, Silty CLAY. Wet.		
18							SILTY CLAY			
20								S-4B (17.5 to 20'): Firm, dark gray, CLAY. Moist.		
22							CLAY			Bentonite Chips (16 to 18')
24	S-5	20 - 25	---	---	0.0		----	S-5 (20 to 26.5'): Soft, gray/brown, Silty CLAY. Moist.		
26							SILTY CLAY			2" Dia. Sch. 20 PVC Well Screen (0.010" Slots) (20 to 29.3')



Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4¼" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

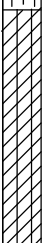

Foreman: P. Wolff

Date Started: 05/11/22

Date Finished: 05/11/22

Logged By: C. Shepsko

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
26	S-6	25 - 30		---	0.0		-----26.5'----- CLAYEY SILT	S-6 (26.5 to 30'): Soft, gray/brown, Clayey SILT. Moist.		#1 Filter Sand (18 to 30')
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										
42										
44										
46										
48										

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

Foreman: P. Wolff

Date Started: 04/04/22

Date Finished: 04/05/22

Logged By: L. Tintle

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
0	S-1	0 - 6	---	---	0.0		-----0'----- FILL	S-1 (0 to 8): Soft, brown, SILT with brick pieces and rock fragments. Moist. FILL.		6" Dia. Protective Steel Casing with Locking Cover (-2.5 to 0')
2										
4										
6	S-2	6 - 10	---	---	0.0					2" Dia. Sch. 40 PVC Riser (-2.5 to 40')
8					1.2		-----8'-----	S-2 (8 to 10'): Soft, dark gray, Clayey SILT with brick fragments. Moist		
10	S-3	10 - 15	---	---	1.4					
12					1.3					
14					1.6					
16					2.1		CLAYEY SILT	S-3A (10 to 11'): No recovery.		Grout (0 to 24')
18					2.9			S-3B (11 to 12'): Soft, brown, Clayey SILT. Moist		
20					5.1			S-3C (12 to 13'): No recovery.		
22					3.3					
24					1.6					
26					1.0		-----13'-----	S-3D (13 to 16'): Firm, dark brown, Silty CLAY. Moist		
28					1.2					
30					1.7		SILTY CLAY			
32					0.7					
34					0.5					
36	S-4	15 - 20	---	---	0.6			S-4A (16 to 18'): Soft, brown, Clayey SILT. Moist		
38					2.3					
40					1.8		-----16'-----	S-4B (18 to 20'): Soft, gray/black Clayey SILT with brick pieces and small rock fragments. Moist		
42					2.2					
44					3.8		CLAYEY SILT			
46					0.8					
48					1.1					
50					2.4					
52					3.8					
54					4.2					
56					7.6					
58	S-5	20 - 25	---	---	24.1			S-5A (20 to 21.5'): Soft, light brown, Clayey SILT. Moist		
60					15.6					
62					21.3		-----21.5'-----	S-5B (21.5 to 24'): Firm, brown, Silty CLAY. Moist		
64					8.9					
66					9.4					
68					8.6		SILTY CLAY			
70					1.9					
72					2.5					

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:




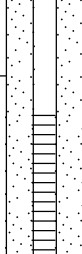

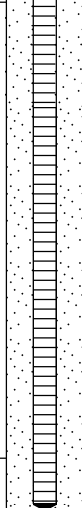


Foreman: P. Wolff

Date Started: 04/04/22

Date Finished: 04/05/22

Logged By: L. Tintle

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
26	S-6	25 - 30		---	7.1		CLAYEY SILT	S-6A (24 to 25.5'): No recovery.  S-6B (25.5 to 27.5'): Soft, brown/gray, Clayey SILT. Moist		Bentonite Chips (24 to 26')
					9.4					
					2.2					
					3.3					
					3.6					
					2.1					
					2.0					
					1.1					
					3.1					
					1.0					
28	S-7	30 - 35		---	1.4		SILTY CLAY	S-6C (27.5 to 30'.5): Firm, gray/black, Silty CLAY. Moist.		#1 Filter Sand (26 to 40')
					2.3					
					0.7					
					1.0					
					0.6					
					5.1					
					5.6					
					9.3					
					4.0					
					2.0					
34	S-8	35 - 40		---	6.6		CLAYEY SILT	S-7 (30.5 to 38'): Soft, brown/gray, Clayey SILT. Moist		2" Dia. Sch. 20 PVC Well Screen (0.010" Slots) (28 to 40')
					15					
					17					
					11					
					13					
					5.9					
					2.9					
					3.1					
					2.8					
					0.7					
38					1.0		SILTY CLAY	S-8 (38 to 40'): Soft, light brown, Silty CLAY. Moist		
					0.7					
					0.4					
40								Boring terminated at 40 feet. No refusal encountered.		
42										
44										
46										
48										

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4¼" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

Foreman: P. Wolff

Date Started: 04/04/22

Logged By: L. Tintle

Date Finished: 04/06/22

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
0	S-1	0 - 6		---	0.0		----	S-1 (0 to 7'): Loose, brown, Clayey SILT with rock fragments, wood pieces, inorganics, concrete. Moist. FILL.		6" Dia. Protective Steel Casing with Locking Cover (-2.8 to 0') 1" Dia. Sch. 40 PVC Riser (-2.8 to 40')
2										
4							FILL			
6	S-2	6 - 10		---	0.0			S-2 (7 to 10'): Soft, light brown, Clayey SILT with wood pieces and brick fragments. Moist. FILL.		
8					1.7 1.3 1.3 1.6					
10	S-3	10 - 15		---	1.7 1.6 4.5 3.0 1.8		----	S-3 (10 to 15'): Firm, brown, Silty CLAY. Moist.		Grout (0 to 24')
12					0.0		SILTY CLAY			
14					1.8 0.5			S-4A (15 to 16'): Firm, brown, Silty CLAY with brick. Moist.		
16	S-4	15 - 20		---	0.6 2.0 1.6		----	S-4B (16 to 18'): Soft, dark brown, Clayey SILT with pieces of concrete and organics. Moist.		
18					2.0 3.6 2.9		CLAYEY SILT			
20					1.1 2.9 2.2 3.6		----	S-4C (18 to 20'): Soft, light brown, Silty SAND. Moist.		
22							SILTY SAND			
24	S-5	20 - 25		---	0.0		----	S-5A (20 to 23'): Firm, black, Silty CLAY. Moist.		
							SILTY CLAY			
					23.3 16.1 33.8 9.6		----	S-5B (23 to 26.5'): Soft, brown/gray, Clayey SILT. Moist.		
							CLAYEY SILT			



Project: Evergreen/Marcus Hook  
Industrial Complex  
Location: Marcus Hook, PA  
Project No.: 4862.04

## Log of Monitoring Well MW-609D

Ground Elevation: 20.1 ft AMSL

Sanborn, Head & Associates, Inc.

Drilling Method: Track Mounted Drill Rig with 4 1/4" ID Hollow Stem Auger

Sampling Method: 4' MacroCore® Sampler

Drilling Company:

Foreman: P. Wolff

Date Started: 04/04/22

Date Finished: 04/06/22

Logged By: L. Tintle

Checked By: C. Costello

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field PID (ppmv)	Log	Description			
26	S-6	25 - 30		---	10.8 2.0 8.2 6.1 7.0 9.5 2.7 3.7 3.0 5.0 2.1 2.0 2.1 3.1 1.0 1.3 3.4 1.0 0.8 5.0 5.5 9.1 4.4 2.3			S-6A (26.5 to 28'): Soft, brown/gray, Clayey SILT with rock fragments. Moist.		Bentonite Chips (24 to 26')
28								S-6B (28 to 28.7'): Soft, black/gray, Clayey SILT. Moist.		#1 Filter Sand (26 to 40')
30	S-7	30 - 35		---	2.1 3.1 1.0 1.3 3.4 1.0 0.8 5.0 5.5 9.1 4.4 2.3		CLAYEY SILT			1" Dia. Sch. 20 PVC Well Screen (0.010" Slots) (28 to 40')
32										
34										
36	S-8	35 - 40		---	7.7 15.9 6.0 2.9 1.3 0.5 1.2 0.5		-----36'----- SILTY CLAY	S-8 (36 to 40'): Firm, brown/gray, Silty CLAY. Moist.		
38										
40							-----40'-----	Boring terminated at 40 feet. No refusal encountered.		
42										
44										
46										
48										

BORING LOG C:\USERS\MRUSSELL\DESKTOP\4862.00.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 9/10/21

## **Appendix C**

### **Laboratory and Data Validation Reports**

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**Sunoco/Evergreen**

**SANHPAFW: Marcus Hook, PA**

**4862.04**

**SGS Job Number: JD42497**

**Sampling Dates: 04/04/22 - 04/06/22**

### Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

**ATTN: Chelsey Shepsko**

**Total number of pages in report: 310**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



**Mike Earp**  
General Manager

**Client Service contact: Victoria Pushkova 732-329-0200**

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.  
Test results relate only to samples analyzed.



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Sample Summary

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD42497-1	04/04/22	13:20 LRT	04/05/22	SO	Soil	MW-608D_0-5_20220404
JD42497-2	04/04/22	13:15 LRT	04/05/22	SO	Soil	MW-609D_0-5_20220404
JD42497-3	04/05/22	11:00 LRT	04/05/22	SO	Soil	MW-609D_5-10_20220405
JD42497-4	04/05/22	11:10 LRT	04/05/22	SO	Soil	MW-609D_10-15_20220405
JD42497-5	04/05/22	11:20 LRT	04/05/22	SO	Soil	MW-609D_15-20_20220405
JD42497-6	04/05/22	11:25 LRT	04/05/22	SO	Soil	MW-609D_20-25_20220405
JD42497-7	04/05/22	11:30 LRT	04/05/22	SO	Soil	MW-609D_25-30_20220405
JD42497-8	04/05/22	11:35 LRT	04/05/22	SO	Soil	MW-609D_30-35_20220405
JD42497-9	04/04/22	14:25 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_0-5_20220404
JD42497-10	04/04/22	14:50 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_5-10_20220404
JD42497-11	04/04/22	15:05 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_10-15_20220404
JD42497-12	04/04/22	15:00 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_15-20_20220404
JD42497-13	04/04/22	15:10 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_20-25_20220404

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

**Sample Summary**

(continued)

Sunoco/Evergreen

**Job No:** JD42497

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected		Matrix	Received	Code	Type	Client Sample ID
	Date	Time By					
JD42497-14	04/04/22	15:20 LRT	04/05/22	SO	Soil		AOI7-BH-22-001_25-30_20220404
JD42497-15	04/05/22	11:40 LRT	04/05/22	SO	Soil		MW-609D_35-40_20220405
JD42497-22	04/06/22	08:40 LRT	04/06/22	SO	Soil		MW-608D_5-10_20220406
JD42497-23	04/06/22	08:45 LRT	04/06/22	SO	Soil		MW-608D_10-15_20220406
JD42497-24	04/06/22	08:50 LRT	04/06/22	SO	Soil		MW-608D_15-20_20220406
JD42497-24D	04/06/22	09:00 LRT	04/06/22	SO	Soil Dup/MSD		MW-608D_15-20_MSD_20220406
JD42497-24S	04/06/22	09:00 LRT	04/06/22	SO	Soil Matrix Spike		MW-608D_15-20_MS_20220406
JD42497-25	04/06/22	08:55 LRT	04/06/22	SO	Soil		MW-608D_20-25_20220406
JD42497-26	04/06/22	09:00 LRT	04/06/22	SO	Soil		MW-608D_25-30_20220406
JD42497-27	04/06/22	09:05 LRT	04/06/22	SO	Soil		MW-608D_30-35_20220406
JD42497-28	04/06/22	13:00 LRT	04/06/22	AQ	Equipment Blank		EB-01_20220406
JD42497-29	04/06/22	09:00 LRT	04/06/22	SO	Soil		MW-608D_15-20_FD_20220406
JD42497-30	04/06/22	09:10 LRT	04/06/22	SO	Soil		MW-608D_35-40_20220406

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

2

**Client:** Sunoco/Evergreen

**Job No:** JD42497

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 4/15/2022 11:56:29 A

Between 04/05/2022 and 04/06/2022, 24 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD42497 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP32253

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42841-1MS, JD42841-1MSD, JD42841-1SDL were used as the QC samples for metals.

**Matrix:** SO

**Batch ID:** MP32168

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42497-6MS, JD42497-6MSD, JD42497-6SDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for Serial Dilution for Iron are outside control limits. Serial dilution indicates possible matrix interference.
- JD42497-7 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-1 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-9 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-5 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-4 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-12 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-2 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

**Matrix:** SO

**Batch ID:** MP32224

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42497-24MS, JD42497-24MSD, JD42497-24PS, JD42497-24SDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MS/MSD for Iron are outside control limits. High rpd due to possible sample nonhomogeneity.
- JD42497-29 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-24 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-26 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

**Matrix:** SO

**Batch ID:** MP32248

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Friday, April 15, 2022

Page 1 of 2

## Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP32248

- Sample(s) JD42748-1MS, JD42748-1MSD, JD42748-1SDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MS/MSD for Iron are outside control limits. High rpd due to possible sample nonhomogeneity.
- RPD(s) for Serial Dilution for Arsenic are outside control limits. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

## General Chemistry By Method SM2540 G 18TH ED MOD

**Matrix:** SO

**Batch ID:** GN27930

- Sample(s) JD42497-2DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO

**Batch ID:** GN28061

- Sample(s) JD42497-24DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO

**Batch ID:** GN28088

- Sample(s) JD42804-1DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO

**Batch ID:** GN28092

- Sample(s) JD42778-5DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

## Summary of Hits

**Job Number:** JD42497  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD42497-1</b>	<b>MW-608D_0-5_20220404</b>					
Arsenic <sup>a</sup>		85.2	5.2		mg/kg	SW846 6010D
Iron		34800	130		mg/kg	SW846 6010D
<b>JD42497-2</b>	<b>MW-609D_0-5_20220404</b>					
Arsenic <sup>a</sup>		153	5.1		mg/kg	SW846 6010D
Iron		34600	130		mg/kg	SW846 6010D
<b>JD42497-3</b>	<b>MW-609D_5-10_20220405</b>					
Arsenic		9.3	3.1		mg/kg	SW846 6010D
Iron		16800	77		mg/kg	SW846 6010D
<b>JD42497-4</b>	<b>MW-609D_10-15_20220405</b>					
Arsenic <sup>a</sup>		13.8	5.6		mg/kg	SW846 6010D
Iron		30300	140		mg/kg	SW846 6010D
<b>JD42497-5</b>	<b>MW-609D_15-20_20220405</b>					
Arsenic <sup>a</sup>		409	12		mg/kg	SW846 6010D
Iron		74700	300		mg/kg	SW846 6010D
<b>JD42497-6</b>	<b>MW-609D_20-25_20220405</b>					
Arsenic		5.8	2.3		mg/kg	SW846 6010D
Iron		16200	57		mg/kg	SW846 6010D
<b>JD42497-7</b>	<b>MW-609D_25-30_20220405</b>					
Arsenic <sup>a</sup>		399	15		mg/kg	SW846 6010D
Iron		144000	380		mg/kg	SW846 6010D
<b>JD42497-8</b>	<b>MW-609D_30-35_20220405</b>					
Arsenic		10400	31		mg/kg	SW846 6010D
Iron		24400	78		mg/kg	SW846 6010D
<b>JD42497-9</b>	<b>AOI7-BH-22-001_0-5_20220404</b>					
Iron		32300	110		mg/kg	SW846 6010D



## Summary of Hits

**Job Number:** JD42497  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
<b>JD42497-10</b>	<b>AOI7-BH-22-001_5-10_20220404</b>					
Arsenic		9.2	2.6		mg/kg	SW846 6010D
Iron		17700	65		mg/kg	SW846 6010D
<b>JD42497-11</b>	<b>AOI7-BH-22-001_10-15_20220404</b>					
Arsenic		6.9	3.4		mg/kg	SW846 6010D
Iron		12400	84		mg/kg	SW846 6010D
<b>JD42497-12</b>	<b>AOI7-BH-22-001_15-20_20220404</b>					
Arsenic <sup>a</sup>		12.6	5.3		mg/kg	SW846 6010D
Iron		27900	130		mg/kg	SW846 6010D
<b>JD42497-13</b>	<b>AOI7-BH-22-001_20-25_20220404</b>					
Arsenic		8270	30		mg/kg	SW846 6010D
Iron		23600	74		mg/kg	SW846 6010D
<b>JD42497-14</b>	<b>AOI7-BH-22-001_25-30_20220404</b>					
Arsenic		1310	3.4		mg/kg	SW846 6010D
Iron		32200	84		mg/kg	SW846 6010D
<b>JD42497-15</b>	<b>MW-609D_35-40_20220405</b>					
Arsenic		1330	6.4		mg/kg	SW846 6010D
Iron		26600	80		mg/kg	SW846 6010D
<b>JD42497-22</b>	<b>MW-608D_5-10_20220406</b>					
Arsenic		38.3	2.4		mg/kg	SW846 6010D
Iron		23700	61		mg/kg	SW846 6010D
<b>JD42497-23</b>	<b>MW-608D_10-15_20220406</b>					
Arsenic		33.4	2.5		mg/kg	SW846 6010D
Iron		24600	62		mg/kg	SW846 6010D
<b>JD42497-24</b>	<b>MW-608D_15-20_20220406</b>					
Arsenic <sup>a</sup>		21.1	12		mg/kg	SW846 6010D
Iron		37200	300		mg/kg	SW846 6010D

## Summary of Hits

Page 3 of 3

**Job Number:** JD42497  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
--------------------------	------------------	-----------------	----	-----	-------	--------

**JD42497-25      MW-608D\_20-25\_20220406**

Arsenic	10.7	2.3	mg/kg	SW846 6010D
Iron	21000	57	mg/kg	SW846 6010D

**JD42497-26      MW-608D\_25-30\_20220406**

Arsenic <sup>a</sup>	112	4.9	mg/kg	SW846 6010D
Iron	28000	120	mg/kg	SW846 6010D

**JD42497-27      MW-608D\_30-35\_20220406**

Arsenic	14800	58	mg/kg	SW846 6010D
Iron	18800	73	mg/kg	SW846 6010D

**JD42497-28      EB-01\_20220406**

No hits reported in this sample.

**JD42497-29      MW-608D\_15-20\_FD\_20220406**

Arsenic <sup>a</sup>	27.3	11	mg/kg	SW846 6010D
Iron	43800	280	mg/kg	SW846 6010D

**JD42497-30      MW-608D\_35-40\_20220406**

Arsenic	10900	30	mg/kg	SW846 6010D
Iron	24100	74	mg/kg	SW846 6010D

(a) Elevated detection limit due to dilution required for high interfering element.



Dayton, NJ

Section 4

4

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_0-5_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-1	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	76.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	85.2	5.2	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	34800	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_0-5_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-2	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	153	5.1	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	34600	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.2  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_5-10_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-3	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	65.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.3	3.1	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16800	77	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

4.3  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_10-15_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-4	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	69.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	13.8	5.6	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	30300	140	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.4  
4



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_15-20_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-5	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	82.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	409	12	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	74700	300	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20-25_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-6	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	89.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.8	2.3	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16200	57	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_25-30_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-7	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	67.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	399	15	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	144000	380	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.7  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_30-35_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-8	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	66.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10400	31	mg/kg	10	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	24400	78	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

4.8  
4

Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_0-5_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-9	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.1
<b>Project:</b>	SANHPPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	< 4.4	4.4	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	32300	110	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.9  
4

Report of Analysis

Client Sample ID: AOI7-BH-22-001\_5-10\_20220404  
Lab Sample ID: JD42497-10  
Matrix: SO - Soil  
Project: SANHPAFW: Marcus Hook, PA

Date Sampled: 04/04/22  
Date Received: 04/05/22  
Percent Solids: 75.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.2	2.6	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	17700	65	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

4.10  
4

Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_10-15_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-11	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	59.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.9	3.4	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	12400	84	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

Report of Analysis

Client Sample ID: AOI7-BH-22-001\_15-20\_20220404  
Lab Sample ID: JD42497-12  
Matrix: SO - Soil  
Project: SANHPAFW: Marcus Hook, PA

Date Sampled: 04/04/22  
Date Received: 04/05/22  
Percent Solids: 73.4

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	12.6	5.3	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	27900	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.12  
4



Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_20-25_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-13	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8270	30	mg/kg	10	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	23600	74	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_25-30_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-14	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	56.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1310	3.4	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	32200	84	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

4.14  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_35-40_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-15	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	65.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1330	6.4	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	26600	80	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194  
(2) Prep QC Batch: MP32168

RL = Reporting Limit

4.15  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_5-10_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-22	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	38.3	2.4	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	23700	61	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52207  
(2) Prep QC Batch: MP32224

RL = Reporting Limit

4.16  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_10-15_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-23	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.1
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By		Method	Prep Method
Arsenic	33.4	2.5	mg/kg	1	04/09/22	04/11/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	24600	62	mg/kg	1	04/09/22	04/11/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52207  
(2) Prep QC Batch: MP32224

RL = Reporting Limit

4.17  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_15-20_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-24	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	84.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By		Method	Prep Method
Arsenic <sup>a</sup>	21.1	12	mg/kg	5	04/09/22	04/12/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37200	300	mg/kg	5	04/09/22	04/12/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.18  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20-25_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-25	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10.7	2.3	mg/kg	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	21000	57	mg/kg	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52222  
(2) Prep QC Batch: MP32248

RL = Reporting Limit

4.19  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_25-30_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-26	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	112	4.9	mg/kg	2	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	28000	120	mg/kg	2	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.20  
4



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_30-35_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-27	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	66.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14800	58	mg/kg	20	04/09/22	04/12/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Iron	18800	73	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

- (1) Instrument QC Batch: MA52207
- (2) Instrument QC Batch: MA52215
- (3) Prep QC Batch: MP32224

RL = Reporting Limit

4.21  
4

Report of Analysis

<b>Client Sample ID:</b>	EB-01_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-28	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	AQ - Equipment Blank	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	< 100	100	ug/l	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52223

(2) Prep QC Batch: MP32253

RL = Reporting Limit

4.22  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_15-20_FD_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-29	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	27.3	11	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	43800	280	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_35-40_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-30	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	68.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10900	30	mg/kg	10	04/09/22	04/12/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Iron	24100	74	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

- (1) Instrument QC Batch: MA52207
- (2) Instrument QC Batch: MA52215
- (3) Prep QC Batch: MP32224

RL = Reporting Limit

4.24  
4

## Misc. Forms

5

### Custody Documents and Other Forms


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Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

JD 42497

5.1



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 2 of 4  
 Please merge with SDG:

JD42497

FED-EX Tracking # \_\_\_\_\_

SGS Quote # 2022 644

Bottle Order Control # \_\_\_\_\_

SGS Job # \_\_\_\_\_

<b>Company Name</b> Sanborn Head & Associates		<b>Project Name</b> Evergreen Marcus Hook		Total Arsenic and Iron by USEPA 6010		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank	
<b>Street Address</b> 1015 Virginia Dr, Suite 100		<b>Street</b> 100 Green Street					
<b>City State Zip</b> Fort Washington, PA, 19034		<b>City State</b> Marcus Hook, PA 19061					
<b>Project Contact</b> Shana Whitney E-mail: shawhitey@sanbornhead.com		<b>Project #</b> 4862.04					
<b>Phone #</b> 603-415-6159		<b>Client Purchase Order #</b> _____		<b>City State Zip</b> Concord, NH, 03301		LAB USE ONLY	
<b>Sampler(s) Name(s)</b> _____		<b>Project Manager</b> Chelsey Shepsko		<b>Account Payable</b> Chelsey Shepsko (cshepsko@sanbornhead.com)			
<b>Field ID / Point of Collection</b> MW-608D 13-20 202204		<b>Collection</b> Date: 4/5/12 Time: 11:00		<b>Matrix</b> SO			
<b>MEQHOI Vial #</b> _____		<b>Number of preserved bottles</b> _____		<b>Number of bottles</b> _____			

☒ Std. 10 Business Days

☐ 5 Day RUSH

☐ 3 Day RUSH

☐ 2 Day RUSH

☐ 1 Day RUSH

☐ other \_\_\_\_\_

Emergency & Rush T/A data available via LabLink

**Approved by (SGS Project Manager)/Date:**  
 \_\_\_\_\_

**Commercial "A" (Level 1)**  
 Commercial "B" (Level 2)  
 FULLT1 (Level 3+4)  
 NJ Reduced  
**x REDT1**

**Commercial "C"**  
 NJ Date of Known Quality Protocol Reporting  
 Commercial "A" = Results Only  
 Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

**Data Deliverable Information**  
 NYASP Category A  
 NYASP Category B  
 State Forms  
 EDD Format SHA EquiS; Stantec EquiS

**Relinquished By Sampler:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

**Date Time**  
 4/5/12 1510

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

**Date Time**  
 4/5/12 16:51

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

**Date Time**  
 4/5/12 16:51

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_


**Date Time**  
 4/5/12 16:51

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

**Date Time**  
 4/5/12 16:51

**Relinquished By:**  
 \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 3 of 4  
 JD 42497

Please merge with SDG:

Company Name  
**Sanborn Head & Associates**

Project Name  
**Evergreen Marcus Hook**

Street Address  
 1015 Virginia Dr, Suite 100  
 Fort Washington, PA, 19034

Street  
 100 Green Street  
 City  
 Marcus Hook, PA 19061

Project Contact  
 Shana Whitney swhitney@sanbornhead.com

Billing Information (if different from Report to)  
 Company Name  
 Sanborn Head & Associates

Phone #  
 603-415-6159

Project #  
 4862.04

Sample(s) Name(s)  
 MECH/DI Vial #

Client Purchase Order #  
 Chelsey Shepsko

Lab Sample #  
 13  
 14  
 15

Field ID / Point of Collection  
 AOI7-BH-22-001 20-25 20220409  
 AOI7-BH-22-001 25-30 20220409  
 MW-6092-35-40-20220405

Date  
 4/19/22  
 4/19/22  
 4/19/22

Time  
 1510  
 1520  
 1140

Sampled by  
 LRT  
 LRT  
 LRT

Matrix  
 SO  
 SO  
 SO

# of bottles  
 1  
 1  
 1

Number of preserved bottles  
 1  
 1  
 1

Total Arsenic and Iron by USEPA 6010  
 X  
 X  
 X

Matrix Codes  
 DW - Drinking Water  
 GW - Ground Water  
 WW - Water  
 SW - Surface Water  
 SO - Soil  
 SL - Sludge SED  
 Sediment OI - Oil  
 LIQ - Other Liquid AIR  
 Air  
 SOL - Other Solid WP  
 Wipe  
 FB-Field Blank EB-  
 Equipment Blank  
 RB-Rinse Blank TB-  
 Trip Blank

Turnaround Time (Business days)  
 5 Day RUSH  
 3 Day RUSH  
 2 Day RUSH  
 1 Day RUSH  
 other

Approved by (SGS Project Manager)/Date:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Commercial "A" (Level 1)  
 Commercial "B" (Level 2)  
 FULLT1 (Level 3+4)  
 NJ Reduced  
 x REDT1 x EDD Format SHA EquiS; Stentac EquiS

NYASP Category A  
 NYASP Category B  
 State Forms  
 Commercial "C"  
 NJ Date of Known Quality Protocol Reporting  
 Commercial "A" = Results Only; Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

Date Time  
 4/19/22 1510

Date Time  
 4/19/22 16:31

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## 5.1

JD42497



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 3 of 4

Please merge with SDG: **JD42497**

Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		Matrix Codes	
Street Address <b>1015 Virginia Dr. Suite 100</b>		Street <b>100 Green Street</b>		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED- Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB-Rinse Blank TB- Trip Blank	
City State Zip <b>Fort Washington PA 19034</b>		City State <b>Marcus Hook PA 19061</b>			
Project Contact <b>Shana Whitney</b> Email: <b>swhitney@sanbornhead.com</b>		Billing Information (if different from Report to) Company Name <b>Sanborn Head &amp; Associates</b>			
Phone # <b>603-415-6159</b>		Project # <b>4862.04</b>			
Fax #		Street Address <b>20 Foundry Street</b>			
Sampler(s) Name(s)		Client Purchase Order #		City State Zip <b>Concord, NH 03301</b>	
Phone #		Project Manager <b>Chelsey Shepsko</b>		Accounts Payable <b>Chelsey Shepsko (cshpsko@sanbornhead.com)</b>	
Lab Sample #		Collection Date Time		Number of preserved bottles	
Field ID / Point of Collection		MEOH/DI Vial #		Matrix	
AO17-111-22-001-20-25-202204				SO	
AO17-111-22-001-25-30-202204				SO	
28 EB-01 20220406		4/6/22 1300 LRT		EB	
24 MW-608D-15-20-MS-20220406		4/6/22 0900 LRT		SD	
MW-608D-15-20-MSD-20220406		4/6/22 0900 LRT		SO	
29 MW-608D-15-20-FD-20220406		4/6/22 0900 LRT		SO	
30 MW-608D-35-40-20220406		4/6/22 0910 LRT		SO	
Turnaround Time (Business days)		Approved by (SGS Project Manager) Date:		Data Deliverable Information	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink		Commercial "A" (Level 1) Commercial "B" (Level 2) FULLT1 (Level 3+4) NJ Reduced <b>x REDT1</b> x EDD Format SHA EquiS; Stantec EquiS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only, Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		NYASP Category A NYASP Category B State Forms	
Requisitioned by: 1		Received By: 1		Date Time: 4/6/22 1710	
Requisitioned by: 2		Received By: 2		Date Time:	
Requisitioned by: 3		Received By: 3		Date Time:	
Requisitioned by: 4		Received By: 4		Date Time:	
Requisitioned by: 5		Received By: 5		Date Time:	
Custody Seal # 40		Intact Not intact		Preserved where applicable	
On		Cooler Temp.			

		<b>CHAIN OF CUSTODY</b> SGS North America Inc. - Dayton 2235 Route 130, Dayton, NJ 08810 TEL: 732-329-0200 FAX 732-329-3499		Page 4 of 4 <b>JD42497</b>																		
		FED-EX Tracking # _____ SGS Order # 2022-644		Bottle Order Control # _____ SGS Job # _____																		
Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Matrix Codes</th> </tr> <tr><td>DW - Drinking Water</td></tr> <tr><td>GW - Ground Water</td></tr> <tr><td>WW - Water</td></tr> <tr><td>SW - Surface Water</td></tr> <tr><td>SO - Soil</td></tr> <tr><td>SL - Slurries/SF/D</td></tr> <tr><td>Sediment OI - Oil</td></tr> <tr><td>LIQ - Other Liquid Aft</td></tr> <tr><td>Air</td></tr> <tr><td>SOL - Other Solid Wf</td></tr> <tr><td>Wipe</td></tr> <tr><td>FB-Field Blank EB-</td></tr> <tr><td>Equipment Blank</td></tr> <tr><td>RB-Rinse Blank TB-</td></tr> <tr><td>Trip Blank</td></tr> </table>		Matrix Codes		DW - Drinking Water	GW - Ground Water	WW - Water	SW - Surface Water	SO - Soil	SL - Slurries/SF/D	Sediment OI - Oil	LIQ - Other Liquid Aft	Air	SOL - Other Solid Wf	Wipe	FB-Field Blank EB-	Equipment Blank	RB-Rinse Blank TB-	Trip Blank
Matrix Codes																						
DW - Drinking Water																						
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Street Address <b>1015 Virginia Dr, Suite 100</b>		Street <b>100 Green Street</b>																				
City State Zip <b>Fort Washington, PA 19034</b>		City State Zip <b>Marcus Hook, PA 19061</b>																				
Project Contact Shana Whitney switney@sanbornhead.com		Project # <b>4862 04</b>																				
Phone # <b>603-415-6159</b>		Client Purchase Order # _____																				
Sampler(s) Name(s) _____		Project Manager <b>Chelsey Shepsko</b>		Accounts Payable _____																		
Lab Sample # _____		Date Time _____		Number of preserved bottles _____																		
Field ID / Point of Collection <b>MW-359D 202204</b>		Matrix <b>SO</b>		# of bottles <b>1</b>																		
<b>MW-550D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-560D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-560D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-560D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-560D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-608D 10/15 202204</b>		<b>4/16/22 0845 LUT SO</b>		<b>1</b>																		
<b>MW-608D 10/15 202204</b>		<b>4/16/22 1035 LUT SO</b>		<b>1</b>																		
<b>MW-608D 10/15 202204</b>		<b>4/16/22 0900 LUT SO</b>		<b>2</b>																		
<b>MW-609D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-609D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>MW-609D 202204</b>		<b>SO</b>		<b>1</b>																		
<b>AQ17-BH-22-001 202204</b>		<b>SO</b>		<b>1</b>																		
<b>AQ17-BH-22-001 202204</b>		<b>SO</b>		<b>1</b>																		
<b>AQ17-BH-22-001 202204</b>		<b>SO</b>		<b>1</b>																		
<b>AQ17-BH-22-001 202204</b>		<b>SO</b>		<b>1</b>																		
Turnaround Time (Business days) _____		Approved by (SGS Project Manager): _____		Data Deliverable Information Commercial "A" (Level 1) _____ NYASP Category A Commercial "B" (Level 2) _____ NYASP Category B FULLT1 (Level 3/4) _____ State Forms NJ Reduced _____ x EDD Format SHA & Stantec EQuIS _____ Commercial "C" _____ Other _____ NJ Date of Known Quality Protocol Reporting _____ Commercial "X" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data																		
X Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		Date Time <b>4/16 1430</b>		Date Time <b>4/16 1710</b>																		
Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____																		
Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____																		

## JD42497: Chain of Custody

Page 8 of 10

## SGS Sample Receipt Summary

**Job Number:** JD42497

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 4/5/2022 4:51:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 1: (1.5);

**Cooler Security**
**Y or N**
**Y or N**

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

**Quality Control Preservation**
**Y or N**
**N/A**

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**
**Y or N**

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Sample Integrity - Condition**
**Y or N**

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s:	pH 1-12: 231619	pH 12+: 203117A	Other: (Specify)
--------------------	-----------------	-----------------	------------------

Comments

 SM089-03  
Rev. Date 12/7/17

JD42497: Chain of Custody

Page 9 of 10

## SGS Sample Receipt Summary

**Job Number:** JD42497

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 4/6/2022 5:10:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 2: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 2: (2.8);

**Cooler Security**
**Y or N**
**Y or N**

- |  |  |
|--|--|
| 1. Custody Seals Present: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |  |
|---|--|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Cooler temp verification: <u>IR Gun</u>  |  |
| 3. Cooler media: <u>Ice (Bag)</u>   |  |
| 4. No. Coolers: <u>1</u>  |  |

**Quality Control Preservation**
**Y or N**
**N/A**

- |   |  |
|---|--|
| 1. Trip Blank present / cooler: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 2. Trip Blank listed on COC: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>    |  |
| 3. Samples preserved properly: <input checked="" type="checkbox"/> <input type="checkbox"/>                           |  |
| 4. VOCs headspace free: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>         |  |

**Sample Integrity - Documentation**
**Y or N**

- |   |  |
|---|--|
| 1. Sample labels present on bottles: <input checked="" type="checkbox"/> <input type="checkbox"/>   |  |
| 2. Container labeling complete: <input checked="" type="checkbox"/> <input type="checkbox"/>        |  |
| 3. Sample container label / COC agree: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |

**Sample Integrity - Condition**
**Y or N**

- |   |  |
|---|--|
| 1. Sample recvd within HT: <input checked="" type="checkbox"/> <input type="checkbox"/>       |  |
| 2. All containers accounted for: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 3. Condition of sample: <u>Intact</u>   |  |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |  |  |
|--|--|
| 1. Analysis requested is clear: <input checked="" type="checkbox"/> <input type="checkbox"/>                             |  |
| 2. Bottles received for unspecified tests: <input type="checkbox"/> <input checked="" type="checkbox"/>                  |  |
| 3. Sufficient volume recvd for analysis: <input checked="" type="checkbox"/> <input type="checkbox"/>                    |  |
| 4. Compositing instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 5. Filtering instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>   |  |

Test Strip Lot #s:	pH 1-12: <u>231619</u>	pH 12+: <u>203117A</u>	Other: (Specify) _____
--------------------	------------------------	------------------------	------------------------

Comments

 SM089-03  
Rev. Date 12/7/17

JD42497: Chain of Custody

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## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD42497-1 Collected: 04-APR-22 13:20 By: LRT Received: 05-APR-22 By: JP MW-608D_0-5_20220404						
JD42497-1	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-1	SW846 6010D	08-APR-22 10:27	ND	07-APR-22	AK	AS,FE
JD42497-2 Collected: 04-APR-22 13:15 By: LRT Received: 05-APR-22 By: JP MW-609D_0-5_20220404						
JD42497-2	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-2	SW846 6010D	08-APR-22 10:32	ND	07-APR-22	AK	AS,FE
JD42497-3 Collected: 05-APR-22 11:00 By: LRT Received: 05-APR-22 By: JP MW-609D_5-10_20220405						
JD42497-3	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-3	SW846 6010D	08-APR-22 09:02	ND	07-APR-22	AK	AS,FE
JD42497-4 Collected: 05-APR-22 11:10 By: LRT Received: 05-APR-22 By: JP MW-609D_10-15_20220405						
JD42497-4	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-4	SW846 6010D	08-APR-22 10:38	ND	07-APR-22	AK	AS,FE
JD42497-5 Collected: 05-APR-22 11:20 By: LRT Received: 05-APR-22 By: JP MW-609D_15-20_20220405						
JD42497-5	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-5	SW846 6010D	08-APR-22 10:43	ND	07-APR-22	AK	AS,FE
JD42497-6 Collected: 05-APR-22 11:25 By: LRT Received: 05-APR-22 By: JP MW-609D_20-25_20220405						
JD42497-6	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104
JD42497-6	SW846 6010D	08-APR-22 08:42	ND	07-APR-22	AK	AS,FE
JD42497-7 Collected: 05-APR-22 11:30 By: LRT Received: 05-APR-22 By: JP MW-609D_25-30_20220405						
JD42497-7	SM2540 G 18TH ED MOD	04-APR-22 16:03	BG			SOL104



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Job No: JD42497

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD42497-7	SW846 6010D	08-APR-22 10:48	ND	07-APR-22	AK	AS,FE
JD42497-8 Collected: 05-APR-22 11:35 By: LRT Received: 05-APR-22 By: JP MW-609D_30-35_20220405						
JD42497-8	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-8	SW846 6010D	08-APR-22 09:32	ND	07-APR-22	AK	FE
JD42497-8	SW846 6010D	08-APR-22 10:53	ND	07-APR-22	AK	AS
JD42497-9 Collected: 04-APR-22 14:25 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_0-5_20220404						
JD42497-9	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-9	SW846 6010D	08-APR-22 11:08	ND	07-APR-22	AK	AS,FE
JD42497-10 Collected: 04-APR-22 14:50 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_5-10_20220404						
JD42497-10	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-10	SW846 6010D	08-APR-22 09:42	ND	07-APR-22	AK	AS,FE
JD42497-11 Collected: 04-APR-22 15:05 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_10-15_20220404						
JD42497-11	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-11	SW846 6010D	08-APR-22 09:47	ND	07-APR-22	AK	AS,FE
JD42497-12 Collected: 04-APR-22 15:00 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_15-20_20220404						
JD42497-12	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-12	SW846 6010D	08-APR-22 11:13	ND	07-APR-22	AK	AS,FE
JD42497-13 Collected: 04-APR-22 15:10 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_20-25_20220404						
JD42497-13	SM2540 G 18TH ED MOD	08-APR-22 16:03	BG			SOL104
JD42497-13	SW846 6010D	08-APR-22 09:57	ND	07-APR-22	AK	FE
JD42497-13	SW846 6010D	08-APR-22 11:18	ND	07-APR-22	AK	AS

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD42497-14 Collected: 04-APR-22 15:20 By: LRT Received: 05-APR-22 By: JP AOI7-BH-22-001_25-30_20220404						
JD42497-14 SM2540 G 18TH ED MOD		04-APR-22 16:03	BG			SOL104
JD42497-14 SW846 6010D		08-APR-22 10:18	ND	07-APR-22 AK		AS,FE
JD42497-15 Collected: 05-APR-22 11:40 By: LRT Received: 05-APR-22 By: JP MW-609D_35-40_20220405						
JD42497-15 SM2540 G 18TH ED MOD		04-APR-22 16:03	BG			SOL104
JD42497-15 SW846 6010D		08-APR-22 10:23	ND	07-APR-22 AK		FE
JD42497-15 SW846 6010D		08-APR-22 11:23	ND	07-APR-22 AK		AS
JD42497-22 Collected: 06-APR-22 08:40 By: LRT Received: 06-APR-22 By: TS MW-608D_5-10_20220406						
JD42497-22 SM2540 G 18TH ED MOD		04-APR-22 16:25	BG			SOL104
JD42497-22 SW846 6010D		11-APR-22 11:12	ND	09-APR-22 SF		AS,FE
JD42497-23 Collected: 06-APR-22 08:45 By: LRT Received: 06-APR-22 By: TS MW-608D_10-15_20220406						
JD42497-23 SM2540 G 18TH ED MOD		04-APR-22 16:25	BG			SOL104
JD42497-23 SW846 6010D		11-APR-22 11:17	ND	09-APR-22 SF		AS,FE
JD42497-24 Collected: 06-APR-22 08:50 By: LRT Received: 06-APR-22 By: TS MW-608D_15-20_20220406						
JD42497-24 SM2540 G 18TH ED MOD		04-APR-22 16:25	BG			SOL104
JD42497-24 SW846 6010D		12-APR-22 09:15	ND	09-APR-22 SF		AS,FE
JD42497-25 Collected: 06-APR-22 08:55 By: LRT Received: 06-APR-22 By: TS MW-608D_20-25_20220406						
JD42497-25 SM2540 G 18TH ED MOD		04-APR-22 16:24	BG			SOL104
JD42497-25 SW846 6010D		13-APR-22 08:17	ND	12-APR-22 SF		AS,FE

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD42497-26 Collected: 06-APR-22 09:00 By: LRT Received: 06-APR-22 By: TS MW-608D_25-30_20220406						
JD42497-26 SM2540 G 18TH ED M00		10-APR-22 16:25	BG			SOL104
JD42497-26 SW846 6010D		12-APR-22 09:30	ND	09-APR-22	SF	AS,FE
JD42497-27 Collected: 06-APR-22 09:05 By: LRT Received: 06-APR-22 By: TS MW-608D_30-35_20220406						
JD42497-27 SM2540 G 18TH ED M00		10-APR-22 16:25	BG			SOL104
JD42497-27 SW846 6010D		11-APR-22 11:37	ND	09-APR-22	SF	FE
JD42497-27 SW846 6010D		12-APR-22 09:45	ND	09-APR-22	SF	AS
JD42497-28 Collected: 06-APR-22 13:00 By: LRT Received: 06-APR-22 By: TS EB-01_20220406						
JD42497-28 SW846 6010D		13-APR-22 12:21	ND	12-APR-22	SF	AS,FE
JD42497-29 Collected: 06-APR-22 09:00 By: LRT Received: 06-APR-22 By: TS MW-608D_15-20_FD_20220406						
JD42497-29 SM2540 G 18TH ED M00		10-APR-22 16:24	BG			SOL104
JD42497-29 SW846 6010D		12-APR-22 09:50	ND	09-APR-22	SF	AS,FE
JD42497-30 Collected: 06-APR-22 09:10 By: LRT Received: 06-APR-22 By: TS MW-608D_35-40_20220406						
JD42497-30 SM2540 G 18TH ED M00		10-APR-22 16:25	BG			SOL104
JD42497-30 SW846 6010D		11-APR-22 11:47	ND	09-APR-22	SF	FE
JD42497-30 SW846 6010D		12-APR-22 09:54	ND	09-APR-22	SF	AS

# SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-1.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-1.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-1.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-1.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-1.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-1.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-1.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-1.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-1.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-1.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-1.1
JD42497-1.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-1.1
JD42497-1.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-2.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-2.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-2.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-2.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-2.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-2.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-2.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-2.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-2.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-2.1
JD42497-2.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-2.1
JD42497-2.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-3.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-3.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-3.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-3.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-3.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-3.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-3.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-3.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-3.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-3.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-3.1
JD42497-3.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-3.1
JD42497-3.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-4.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-4.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-4.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage

# SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-4.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-4.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-4.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-4.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-4.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-4.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-4.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-4.1
JD42497-4.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-4.1
JD42497-4.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-5.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-5.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-5.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-5.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-5.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-5.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-5.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-5.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-5.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-5.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-5.1
JD42497-5.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-5.1
JD42497-5.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-6.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-6.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-6.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-6.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-6.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-6.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-6.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-6.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-6.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-6.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-6.1
JD42497-6.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-6.1
JD42497-6.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-7.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-7.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-7.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-7.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-7.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-7.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-7.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-7.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-7.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-7.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-7.1
JD42497-7.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-7.1
JD42497-7.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-8.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-8.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-8.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-8.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-8.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-8.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-8.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-8.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-8.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-8.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-8.1
JD42497-8.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-8.1
JD42497-8.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-9.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-9.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-9.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-9.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-9.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-9.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-9.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-9.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-9.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-9.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-9.1
JD42497-9.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-9.1
JD42497-9.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-10.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-10.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-10.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-10.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-10.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-10.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-10.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage

# SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-10.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-10.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-10.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-10.1
JD42497-10.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-10.1
JD42497-10.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-11.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-11.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-11.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-11.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-11.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-11.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-11.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-11.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-11.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-11.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-11.1
JD42497-11.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-11.1
JD42497-11.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-12.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-12.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-12.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-12.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-12.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-12.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-12.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-12.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-12.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-12.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-12.1
JD42497-12.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-12.1
JD42497-12.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-13.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-13.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-13.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-13.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-13.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-13.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-13.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-13.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-13.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage



# SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-13.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-13.1
JD42497-13.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-13.1
JD42497-13.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-14.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-14.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-14.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-14.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-14.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-14.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-14.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-14.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-14.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-14.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-14.1
JD42497-14.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-14.1
JD42497-14.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-15.1	Stephen Sourour	Secured Storage	04/05/22 21:37	Return to Storage
JD42497-15.1	Secured Storage	Benjamin Gaines	04/06/22 09:44	Retrieve from Storage
JD42497-15.1	Benjamin Gaines	Secured Staging Area	04/06/22 09:44	Return to Storage
JD42497-15.1	Secured Staging Area	Benjamin Gaines	04/06/22 09:45	Retrieve from Storage
JD42497-15.1	Benjamin Gaines	Secured Storage	04/06/22 12:37	Return to Storage
JD42497-15.1	Secured Storage	Todd Shoemaker	04/06/22 16:13	Retrieve from Storage
JD42497-15.1	Todd Shoemaker	Secured Staging Area	04/06/22 16:13	Return to Storage
JD42497-15.1	Secured Staging Area	Alyssa Koshy	04/07/22 08:10	Retrieve from Storage
JD42497-15.1	Alyssa Koshy	Secured Storage	04/07/22 11:43	Return to Storage
JD42497-15.1.1	Alyssa Koshy	Metals Digestion	04/07/22 11:03	Digestate from JD42497-15.1
JD42497-15.1.1	Metals Digestion	Alyssa Koshy	04/07/22 11:03	Digestate from JD42497-15.1
JD42497-15.1.1	Alyssa Koshy	Metals Digestate Storage	04/07/22 11:03	Return to Storage
JD42497-22.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-22.1	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-22.1	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-22.1	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-22.1	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-22.1	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage
JD42497-22.1	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-22.1	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-22.1	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-22.1.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-22.1



# SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-22.1.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-22.1
JD42497-22.1.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage
JD42497-23.1	Tyler Strong	Secured Storage	04/07/22 21:38	Return to Storage
JD42497-23.1	Secured Storage	Todd Shoemaker	04/08/22 07:36	Retrieve from Storage
JD42497-23.1	Todd Shoemaker	Secured Staging Area	04/08/22 07:36	Return to Storage
JD42497-23.1	Secured Staging Area	Daniel Broche	04/08/22 09:35	Retrieve from Storage
JD42497-23.1	Daniel Broche	Secured Storage	04/08/22 18:15	Return to Storage
JD42497-23.1	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-23.1	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-23.1	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-23.1	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-23.1	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage
JD42497-23.1	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-23.1	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-23.1	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-23.1.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-23.1
JD42497-23.1.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-23.1
JD42497-23.1.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage
JD42497-23.2	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-23.2	Secured Storage	Dave Hunkele	04/08/22 09:00	Retrieve from Storage
JD42497-23.2	Dave Hunkele	Secured Staging Area	04/08/22 09:00	Return to Storage
JD42497-23.2	Secured Staging Area	Marcin Kotowski	04/08/22 10:03	Retrieve from Storage
JD42497-23.2	Marcin Kotowski	Secured Staging Area	04/08/22 11:38	Return to Storage
JD42497-24.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-24.1	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage
JD42497-24.1	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-24.1	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-24.1	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-24.2	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-24.3	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-24.3	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-24.3	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-24.3	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-24.3	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-24.3.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-24.3
JD42497-24.3.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-24.3
JD42497-24.3.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-25.1	Tyler Strong	Secured Storage	04/07/22 21:38	Return to Storage
JD42497-25.1	Secured Storage	Todd Shoemaker	04/08/22 07:36	Retrieve from Storage
JD42497-25.1	Todd Shoemaker	Secured Staging Area	04/08/22 07:36	Return to Storage
JD42497-25.1	Secured Staging Area	Daniel Broche	04/08/22 09:35	Retrieve from Storage
JD42497-25.1	Daniel Broche	Secured Storage	04/08/22 18:15	Return to Storage
JD42497-25.1	Secured Storage	Benjamin Gaines	04/11/22 14:00	Retrieve from Storage
JD42497-25.1	Benjamin Gaines	Secured Staging Area	04/11/22 14:00	Return to Storage
JD42497-25.1	Secured Staging Area	Benjamin Gaines	04/11/22 14:01	Retrieve from Storage
JD42497-25.1	Benjamin Gaines	Secured Storage	04/11/22 15:09	Return to Storage
JD42497-25.2	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-25.2	Secured Storage	Dave Hunkele	04/08/22 09:00	Retrieve from Storage
JD42497-25.2	Dave Hunkele	Secured Staging Area	04/08/22 09:00	Return to Storage
JD42497-25.2	Secured Staging Area	Marcin Kotowski	04/08/22 10:03	Retrieve from Storage
JD42497-25.2	Marcin Kotowski	Secured Staging Area	04/08/22 11:38	Return to Storage
JD42497-25.2	Secured Storage	Benjamin Gaines	04/11/22 14:00	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD42497-25.2	Benjamin Gaines	Secured Staging Area	04/11/22 14:00	Return to Storage
JD42497-25.2	Secured Staging Area	Benjamin Gaines	04/11/22 14:01	Retrieve from Storage
JD42497-25.2	Secured Storage	Sarah Fichot	04/11/22 14:37	Retrieve from Storage
Analyst unavailable for custody transfer.				
JD42497-25.2	Sarah Fichot	Secured Storage	04/11/22 14:49	Return to Storage
JD42497-25.2.1	Sarah Fichot	Metals Digestion	04/11/22 14:45	Digestate from JD42497-25.2
JD42497-25.2.1	Metals Digestion	Sarah Fichot	04/11/22 14:49	Digestate from JD42497-25.2
JD42497-25.2.1	Sarah Fichot	Metals Digestate Storage	04/11/22 14:49	Return to Storage
JD42497-26.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-26.1	Secured Storage	Todd Shoemaker	04/08/22 07:36	Retrieve from Storage
JD42497-26.1	Todd Shoemaker	Secured Staging Area	04/08/22 07:36	Return to Storage
JD42497-26.1	Secured Staging Area	Daniel Broche	04/08/22 09:35	Retrieve from Storage
JD42497-26.1	Daniel Broche	Secured Storage	04/08/22 18:15	Return to Storage
JD42497-26.2	Tyler Strong	Secured Storage	04/07/22 21:38	Return to Storage
JD42497-26.2	Secured Storage	Todd Shoemaker	04/08/22 10:07	Retrieve from Storage
JD42497-26.2	Todd Shoemaker	Secured Staging Area	04/08/22 10:07	Return to Storage
JD42497-26.2	Secured Staging Area	Naomi Altenbur	04/08/22 14:46	Retrieve from Storage
JD42497-26.2	Naomi Altenbur	Secured Storage	04/08/22 18:08	Return to Storage
JD42497-26.2	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-26.2	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-26.2	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-26.2	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-26.2	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage

# SGS Internal Chain of Custody

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-26.2	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-26.2	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-26.2	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-26.2.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-26.2
JD42497-26.2.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-26.2
JD42497-26.2.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage
JD42497-26.3	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-26.3	Secured Storage	Dave Hunkele	04/08/22 09:00	Retrieve from Storage
JD42497-26.3	Dave Hunkele	Secured Staging Area	04/08/22 09:00	Return to Storage
JD42497-26.3	Secured Staging Area	Marcin Kotowski	04/08/22 10:03	Retrieve from Storage
JD42497-26.3	Marcin Kotowski	Secured Staging Area	04/08/22 11:38	Return to Storage
JD42497-26.3	Secured Storage	Benjamin Gaines	04/11/22 14:00	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD42497-26.3	Benjamin Gaines	Secured Staging Area	04/11/22 14:00	Return to Storage
JD42497-26.3	Secured Staging Area	Benjamin Gaines	04/11/22 14:01	Retrieve from Storage
JD42497-26.3	Benjamin Gaines	Secured Storage	04/11/22 15:09	Return to Storage
JD42497-26.3	Epiphania Njoku		04/12/22 12:32	Subcontract
sub				
JD42497-27.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-27.1	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-27.1	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-27.1	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-27.1	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-27.1	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage
JD42497-27.1	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-27.1	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-27.1	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-27.1.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-27.1
JD42497-27.1.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-27.1
JD42497-27.1.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage
JD42497-28.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-28.1	Christian King	Secured Staging Area	04/11/22 18:52	Return to Storage
stage				
JD42497-28.1	Secured Staging Area	Alyssa Koshy	04/12/22 08:58	Retrieve from Storage
JD42497-28.1	Alyssa Koshy	Secured Storage	04/12/22 13:15	Return to Storage
JD42497-28.1.1	Alyssa Koshy	Metals Digestion	04/12/22 12:20	Digestate from JD42497-28.1
JD42497-28.1.1	Metals Digestion	Alyssa Koshy	04/12/22 12:21	Digestate from JD42497-28.1
JD42497-28.1.1	Alyssa Koshy	Metals Digestate Storage	04/12/22 12:21	Return to Storage

## SGS Internal Chain of Custody

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 04/05/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD42497-29.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-29.1	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-29.1	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-29.1	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-29.1	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-29.1	Secured Storage	Benjamin Gaines	04/11/22 14:00	Retrieve from Storage
JD42497-29.1	Benjamin Gaines	Secured Staging Area	04/11/22 14:00	Return to Storage
JD42497-29.1	Secured Staging Area	Benjamin Gaines	04/11/22 14:01	Retrieve from Storage
JD42497-29.1	Benjamin Gaines	Secured Storage	04/11/22 15:09	Return to Storage
JD42497-29.1.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-29.1
JD42497-29.1.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-29.1
JD42497-29.1.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage
JD42497-30.1	Aleandi Rodriguez	Secured Storage	04/07/22 22:03	Return to Storage
JD42497-30.1	Secured Storage	Dave Hunkele	04/09/22 06:19	Retrieve from Storage
JD42497-30.1	Dave Hunkele	Secured Staging Area	04/09/22 06:19	Return to Storage
JD42497-30.1	Secured Staging Area	Bisma Rizvi	04/09/22 11:39	Retrieve from Storage
JD42497-30.1	Bisma Rizvi	Secured Storage	04/09/22 18:01	Return to Storage
JD42497-30.1	Secured Storage	Benjamin Gaines	04/10/22 14:30	Retrieve from Storage
JD42497-30.1	Benjamin Gaines	Secured Staging Area	04/10/22 14:30	Return to Storage
JD42497-30.1	Secured Staging Area	Benjamin Gaines	04/10/22 14:40	Retrieve from Storage
JD42497-30.1	Benjamin Gaines	Secured Storage	04/11/22 13:29	Return to Storage
JD42497-30.1.1	Bisma Rizvi	Metals Digestion	04/09/22 14:44	Digestate from JD42497-30.1
JD42497-30.1.1	Metals Digestion	Bisma Rizvi	04/09/22 14:45	Digestate from JD42497-30.1
JD42497-30.1.1	Bisma Rizvi	Metals Digestate Storage	04/09/22 14:45	Return to Storage

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
Analyst: ND      Run ID: MA52194  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:28	MA52194-STD1	1		STDA
06:33	MA52194-STD2	1		STDB
06:38	MA52194-ICV1	1		
06:46	MA52194-ICB1	1		
06:57	MA52194-ICCV1	1		
07:07	MA52194-CCB1	1		
07:26	MA52194-CRI1	1		
07:31	MA52194-CRID1	1		
07:36	MA52194-ICSA1	1		
07:41	MA52194-ICSAB1	1		
07:46	MA52194-HSTD1	1		
07:52	MA52194-HSTD2	1		
07:57	ZZZZZZ	1		
08:02	ZZZZZZ	1		
08:07	ZZZZZZ	1		
08:12	MA52194-CCV1	1		
08:17	MA52194-CCB2	1		
08:23	MP32168-MB1	1		
08:28	MP32168-B1	1		
08:33	MP32168-S1	1		
08:37	MP32168-S2	1		
08:42	JD42497-6	1		
08:47	MP32168-SD1	5		
08:52	JD42497-1	1		
08:57	JD42497-2	1		
09:02	JD42497-3	1		
09:07	MA52194-CCV2	1		
09:12	MA52194-CCB3	1		
09:18	JD42497-4	1		
09:23	JD42497-5	1		
09:28	JD42497-7	1		
09:32	JD42497-8	1		
09:37	JD42497-9	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
Analyst: ND Run ID: MA52194  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:42	JD42497-10	1		
09:47	JD42497-11	1		
09:52	JD42497-12	1		
09:57	JD42497-13	1		
10:02	MA52194-CCV3	1		
10:07	MA52194-CCB4	1		
10:12	MP32131-SD1	5		
10:18	JD42497-14	1		
10:23	JD42497-15	1		
10:27	JD42497-1	2		
10:32	JD42497-2	2		
10:38	JD42497-4	2		
10:43	JD42497-5	5		
10:48	JD42497-7	5		
10:53	JD42497-8	10		high rsd
10:58	MA52194-CCV4	1		
11:03	MA52194-CCB5	1		
11:08	JD42497-9	2		
11:13	JD42497-12	2		
11:18	JD42497-13	10		
11:23	JD42497-15	2		
11:28	JD42497-8	20		
----->	Last reportable sample/prep for job JD42497			
11:33	ZZZZZZ	1		
11:38	MA52194-CRI2	1		
11:59	MA52194-ICSA2	1		
12:04	MA52194-ICSAB2	1		
12:09	MA52194-CCV5	1		
12:14	MA52194-CCB6	1		
----->	Last reportable CCB for job JD42497			
12:19	ZZZZZZ	1		
12:24	MP32169-S1	2		
12:29	MP32169-S2	2		
12:34	JD41986-14	2		(sample used for QC only; not part of login JD42497)
12:39	MP32169-SD1	10		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
Analyst: ND      Run ID: MA52194  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:44	ZZZZZZ	2		
12:49	ZZZZZZ	5		
12:54	ZZZZZZ	2		
12:59	ZZZZZZ	2		
13:04	MA52194-CCV6	1		
13:09	MA52194-CCB7	1		
13:15	ZZZZZZ	2		
13:20	ZZZZZZ	2		
13:25	ZZZZZZ	2		
13:30	ZZZZZZ	2		
13:35	ZZZZZZ	2		
13:40	ZZZZZZ	2		
13:45	ZZZZZZ	2		
13:50	ZZZZZZ	2		
13:55	ZZZZZZ	5		
14:00	MA52194-CCV7	1		
14:05	MA52194-CCB8	1		
14:10	ZZZZZZ	1		
14:15	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
 Run ID: MA52194

Time	Sample Description	Element: Dilution	A F s e
06:38	MA52194-ICV1	1	X X
06:46	MA52194-ICB1	1	X X
06:57	MA52194-ICCV1	1	X X
07:07	MA52194-CCB1	1	X X
07:26	MA52194-CRI1	1	X X
07:31	MA52194-CRID1	1	X X
07:36	MA52194-ICSA1	1	X X
07:41	MA52194-ICSAB1	1	X X
07:46	MA52194-HSTD1	1	X X
07:52	MA52194-HSTD2	1	X X
07:57	ZZZZZZ	1	
08:02	ZZZZZZ	1	
08:07	ZZZZZZ	1	
08:12	MA52194-CCV1	1	X X
08:17	MA52194-CCB2	1	X X
08:23	MP32168-MB1	1	X X
08:28	MP32168-B1	1	X X
08:33	MP32168-S1	1	X X
08:37	MP32168-S2	1	X X
08:42	JD42497-6	1	X X
08:47	MP32168-SD1	5	X X
08:52	JD42497-1	1	
08:57	JD42497-2	1	
09:02	JD42497-3	1	X X
09:07	MA52194-CCV2	1	X X
09:12	MA52194-CCB3	1	X X
09:18	JD42497-4	1	
09:23	JD42497-5	1	
09:28	JD42497-7	1	
09:32	JD42497-8	1	X
09:37	JD42497-9	1	
09:42	JD42497-10	1	X X
09:47	JD42497-11	1	X X
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Element: Dilution	A F s e
09:52	JD42497-12	1	
09:57	JD42497-13	1	X
10:02	MA52194-CCV3	1	X X
10:07	MA52194-CCB4	1	X X
10:12	MP32131-SD1	5	
10:18	JD42497-14	1	X X
10:23	JD42497-15	1	X
10:27	JD42497-1	2	X X
10:32	JD42497-2	2	X X
10:38	JD42497-4	2	X X
10:43	JD42497-5	5	X X
10:48	JD42497-7	5	X X
10:53	JD42497-8	10	X
10:58	MA52194-CCV4	1	X X
11:03	MA52194-CCB5	1	X X
11:08	JD42497-9	2	X X
11:13	JD42497-12	2	X X
11:18	JD42497-13	10	X
11:23	JD42497-15	2	X
11:28	JD42497-8	20	
11:33	ZZZZZZ	1	
11:38	MA52194-CRI2	1	X X
11:59	MA52194-ICSA2	1	X X
12:04	MA52194-ICSAB2	1	X X
12:09	MA52194-CCV5	1	X X
12:14	MA52194-CCB6	1	X X
12:19	ZZZZZZ	1	
12:24	MP32169-S1	2	X
12:29	MP32169-S2	2	X
12:34	JD41986-14	2	X (a)
12:39	MP32169-SD1	10	X
12:44	ZZZZZZ	2	
12:49	ZZZZZZ	5	
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
Analyst: ND Run ID: MA52194  
Parameters: As,Fe

Time	Sample Description	Dilution	Element: A F s e
12:54	ZZZZZZ	2	
12:59	ZZZZZZ	2	
13:04	MA52194-CCV6	1	X X
13:09	MA52194-CCB7	1	X X
13:15	ZZZZZZ	2	
13:20	ZZZZZZ	2	
13:25	ZZZZZZ	2	
13:30	ZZZZZZ	2	
13:35	ZZZZZZ	2	
13:40	ZZZZZZ	2	
13:45	ZZZZZZ	2	
13:50	ZZZZZZ	2	
13:55	ZZZZZZ	5	
14:00	MA52194-CCV7	1	X X
14:05	MA52194-CCB8	1	X X
14:10	ZZZZZZ	1	
14:15	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD42497.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/08/22  
 Run ID: MA52194  
 Methods: SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:28	MA52194-STD1	2229 R	76938 R	2668 R	5905 R
06:33	MA52194-STD2	2150	73976	2666	5600
06:38	MA52194-ICV1	2189	75390	2653	5674
06:46	MA52194-ICB1	2236	76874	2609	5914
06:57	MA52194-ICCV1	2198	75972	2733	5699
07:07	MA52194-CCB1	2227	77622	2710	5894
07:26	MA52194-CRI1	2212	76782	2731	5844
07:31	MA52194-CRID1	2230	77099	2737	5891
07:36	MA52194-ICSA1	2040	70623	2693	5316
07:41	MA52194-ICSAB1	2042	70544	2704	5330
07:46	MA52194-HSTD1	2201	76611	2736	5933
07:52	MA52194-HSTD2	2078	71500	2654	5368
07:57	ZZZZZZ	2231	78187	2765	6068
08:02	ZZZZZZ	2210	77950	2777	5967
08:07	ZZZZZZ	2276	78736	2791	6024
08:12	MA52194-CCV1	2180	75738	2735	5658
08:17	MA52194-CCB2	2235	78245	2758	5926
08:23	MP32168-MB1	2217	78298	2799	5887
08:28	MP32168-B1	2210	76784	2778	5776
08:33	MP32168-S1	2283	78674	2933	5794
08:37	MP32168-S2	2287	78767	2928	5808
08:42	JD42497-6	2505	86483	3166	5915
08:47	MP32168-SD1	2362	81918	2920	5920
08:52	JD42497-1	No results reported for the elements associated with this internal standard.			
08:57	JD42497-2	2394	80218	3080	5871
09:02	JD42497-3	2304	79688	2948	5724
09:07	MA52194-CCV2	2198	76276	2767	5702
09:12	MA52194-CCB3	2249	78314	2774	5956
09:18	JD42497-4	2316	80269	2953	5969
09:23	JD42497-5	2275	79626	2971	6152
09:28	JD42497-7	2592	89607	3400	6512
09:32	JD42497-8	2384	83109	3093	5770
09:37	JD42497-9	2242	77778	2852	5864

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/08/22      Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
09:42	JD42497-10	2308	78191	2939	5800
09:47	JD42497-11	2289	78091	2913	5707
09:52	JD42497-12	2277	79590	2916	5818
09:57	JD42497-13	2340	80644	2982	5889
10:02	MA52194-CCV3	2192	75361	2769	5701
10:07	MA52194-CCB4	2228	76435	2729	5916
10:12	MP32131-SD1	2232	77755	2796	5920
10:18	JD42497-14	2395	82310	3030	5935
10:23	JD42497-15	2380	81880	3052	5904
10:27	JD42497-1	2344	79423	2906	5959
10:32	JD42497-2	2317	78312	2956	5813
10:38	JD42497-4	2270	77933	2866	5893
10:43	JD42497-5	2253	77728	2833	5940
10:48	JD42497-7	2319	79270	2861	6008
10:53	JD42497-8	2259	77878	2776	5871
10:58	MA52194-CCV4	2198	74797	2800	5705
11:03	MA52194-CCB5	2245	77804	2768	5947
11:08	JD42497-9	2220	77228	2849	5783
11:13	JD42497-12	2263	78434	2944	8632 !
11:18	JD42497-13	2272	78406	2834	5934
11:23	JD42497-15	2297	79233	2929	16390 !
11:28	JD42497-8	2243	77799	2811	5875
11:33	ZZZZZZ	2222	77554	2795	5871
11:38	MA52194-CRI2	2217	76909	2782	5838
11:59	MA52194-ICSA2	2016	70018	2733	5236
12:04	MA52194-ICSAB2	2029	69876	2729	5294
12:09	MA52194-CCV5	2209	76727	2846	5711
12:14	MA52194-CCB6	2250	77468	2831	5940
12:19	ZZZZZZ	2216	76869	2832	5763
12:24	MP32169-S1	2654	89031	3392	5853
12:29	MP32169-S2	2351	79599	3026	5862
12:34	JD41986-14	2355	80956	3007	6017
12:39	MP32169-SD1	2252	78043	2821	6085

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
Analyst: ND Run ID: MA52194  
Parameters: As,Fe

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:44	ZZZZZZ	2285	77397	2915	6003
12:49	ZZZZZZ	2281	78667	2885	6108
12:54	ZZZZZZ	2287	79127	2875	6874
12:59	ZZZZZZ	2312	80202	2933	5989
13:04	MA52194-CCV6	2197	76237	2789	5671
13:09	MA52194-CCB7	2245	77456	2798	5914
13:15	ZZZZZZ	2265	77798	2883	5988
13:20	ZZZZZZ	2321	78878	2914	6057
13:25	ZZZZZZ	2419	82719	3063	5942
13:30	ZZZZZZ	2384	82071	3042	5936
13:35	ZZZZZZ	2415	81698	3056	5928
13:40	ZZZZZZ	2353	80803	2977	5946
13:45	ZZZZZZ	2414	82288	3080	5850
13:50	ZZZZZZ	2482	86178	3192	5717
13:55	ZZZZZZ	2327	78521	2936	5874
14:00	MA52194-CCV7	2209	76392	2759	5698
14:05	MA52194-CCB8	2240	77746	2793	5913
14:10	ZZZZZZ	2253	78458	2835	5947
14:15	ZZZZZZ	2255	79052	2833	5946

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52194 Units: ug/l

Time: Sample ID:			06:46 ICB1		07:07 CCB1		08:17 CCB2		09:12 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	9.2								
Antimony	6.0	2.8								
Arsenic	3.0	2.6	-1.40	<3.0	0.400	<3.0	-1.40	<3.0	-1.00	<3.0
Barium	200	.2								
Beryllium	1.0	.2								
Bismuth	20	2.5								
Boron	100	1.8								
Cadmium	3.0	.4								
Calcium	5000	13								
Cerium	100									
Chromium	10	.7								
Cobalt	50	.6								
Copper	10	.7								
Iron	100	3.3	5.20	<100	5.10	<100	11.3	<100	8.50	<100
Lead	3.0	2								
Lithium	50	1.5								
Magnesium	5000	25								
Manganese	15	.1								
Molybdenum	20	.6								
Nickel	10	.8								
Phosphorus	50	7								
Potassium	10000	35								
Selenium	10	3.6								
Silicon	200	2.2								
Silver	10	.6	anr							
Sodium	10000	14								
Strontium	10	.1								
Sulfur	50	3.7								
Thallium	10	5.2								
Tin	10	1.4								
Titanium	10	.8								
Tungsten	50	1.3								
Vanadium	50	.5								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52194 Units: ug/l

Time: Sample ID:			06:46 ICB1		07:07 CCB1		08:17 CCB2		09:12 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.3	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52194 Units: ug/l

Time: Sample ID:			10:07 CCB4		11:03 CCB5		12:14 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	9.2						
Antimony	6.0	2.8						
Arsenic	3.0	2.6	-0.400	<3.0	-1.00	<3.0	-0.500	<3.0
Barium	200	.2						
Beryllium	1.0	.2						
Bismuth	20	2.5						
Boron	100	1.8						
Cadmium	3.0	.4						
Calcium	5000	13						
Cerium	100							
Chromium	10	.7						
Cobalt	50	.6						
Copper	10	.7						
Iron	100	3.3	8.30	<100	9.70	<100	12.5	<100
Lead	3.0	2						
Lithium	50	1.5						
Magnesium	5000	25						
Manganese	15	.1						
Molybdenum	20	.6						
Nickel	10	.8						
Phosphorus	50	7						
Potassium	10000	35						
Selenium	10	3.6						
Silicon	200	2.2						
Silver	10	.6	anr					
Sodium	10000	14						
Strontium	10	.1						
Sulfur	50	3.7						
Thallium	10	5.2						
Tin	10	1.4						
Titanium	10	.8						
Tungsten	50	1.3						
Vanadium	50	.5						

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: result < RL      Run ID: MA52194      Units: ug/l

Time: Sample ID:			10:07 CCB4		11:03 CCB5		12:14 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc                      20                      .3                      anr

Zirconium              10                      .5

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52194      Units: ug/l

Time:		06:57	
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum			
Antimony			
Arsenic	2000	1890	94.5
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron	40000	39200	98.0
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver	anr		
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52194      Units: ug/l

Time:		06:57	
Sample ID:		ICCV	
Metal		True	
		Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time:		06:38		08:12		09:07	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum							
Antimony							
Arsenic	2000	1960	98.0	2000	1900	95.0	2000
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper							
Iron	40000	40300	100.8	40000	39200	98.0	40000
Lead							
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel							
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time:		06:38			08:12			09:07		
Sample ID:	ICV	ICV1	CCV		CCV1	CCV		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time: Sample ID:		10:02 CCV3		10:58 CCV4		12:09 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony									
Arsenic	2000	1910	95.5	2000	1950	97.5	2000	1920	96.0
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Cerium									
Chromium									
Cobalt									
Copper									
Iron	40000	38200	95.5	40000	38800	97.0	40000	39000	97.5
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver	anr								
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time:		10:02			10:58			12:09		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5  
6



# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52194 Units: ug/l

Time:		07:46			07:52		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony							
Arsenic	8000	7330	91.6				
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper							
Iron				200000	191000	95.5	
Lead							
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel							
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52194      Units: ug/l

Time:		07:46		07:52	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52194 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:26 CRI1	% Rec	07:31 CRID1	% Rec	11:38 CRI2	% Rec
Metal	True	True	True	Results		Results		Results	
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	6.90	86.3			6.60	82.5
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0						
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500		109	109.0			112	112.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0						
Molybdenum	20								
Nickel	10		4.0						
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000						
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52194 Units: ug/l

Time:					07:26		07:31		11:38	
Sample ID:	CRI	CRIA	CRID		CRI1		CRID1		CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52194      Units: ug/l

Time: Sample ID:	ICSA	ICSAB	07:36 ICSAB1		07:41 ICSAB1		11:59 ICSAB2		12:04 ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	494000	98.8	498000	99.6	500000	100.0	504000	100.8
Antimony		1000	4.60		1010	101.0	-0.100		1030	103.0
Arsenic		1000	0.00		995	99.5	-0.900		990	99.0
Barium		500	4.60		489	97.8	4.60		494	98.8
Beryllium		500	0.300		482	96.4	0.300		487	97.4
Bismuth		500	-2.90		509	101.8	-3.80		515	103.0
Boron		500	1.30		497	99.4	1.50		500	100.0
Cadmium		1000	0.100		1030	103.0	0.100		1040	104.0
Calcium	400000	400000	373000	93.3	382000	95.5	376000	94.0	384000	96.0
Cerium			36.2		514*		39.4		528*	
Chromium		500	-0.800		477	95.4	-0.700		482	96.4
Cobalt		500	0.700		471	94.2	0.400		476	95.2
Copper		500	0.00		523	104.6	0.300		523	104.6
Iron	200000	200000	185000	92.5	192000	96.0	187000	93.5	193000	96.5
Lead		1000	-0.100		940	94.0	3.00*		952	95.2
Lithium		500	-1.90		550	110.0	-8.00		537	107.4
Magnesium	500000	500000	486000	97.2	484000	96.8	492000	98.4	489000	97.8
Manganese		500	11.6		514	102.8	11.3		520	104.0
Molybdenum		500	0.900		469	93.8	1.30		473	94.6
Nickel		1000	2.40		934	93.4	2.30		941	94.1
Phosphorus		500	10.6		493	98.6	11.4		496	99.2
Potassium			57.2		57.8		83.2		58.5	
Selenium		1000	9.30		954	95.4	8.80		967	96.7
Silicon		500	-16.1		509	101.8	-15.6		514	102.8
Silver		1000	3.70		1050	105.0	3.60		1060	106.0
Sodium			3.60		6.80		-1.00		8.50	
Strontium		500	-1.20		494	98.8	-1.10		504	100.8
Sulfur		500	19.4		513	102.6	19.1		520	104.0
Thallium		1000	-6.90		923	92.3	-3.30		931	93.1
Tin		500	-6.50		454	90.8	-5.80		457	91.4
Titanium		500	-1.60		475	95.0	-1.50		483	96.6
Tungsten		500	-4.70		480	96.0	-5.80		479	95.8
Vanadium		500	-0.900		480	96.0	-1.00		484	96.8

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52194 Units: ug/l

Time:				07:36			07:41			11:59			12:04
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	8.50			944	94.4	9.10		951	95.1		
Zirconium		500	1.10			454	90.8	0.900		458	91.6		

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.8  
6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:58	MA52207-STD1	1		STDA
09:03	MA52207-STD2	1		STDB
09:08	MA52207-ICV1	1		
09:16	MA52207-ICB1	1		
09:21	MA52207-CRI1	1		
09:27	MA52207-ICCV1	1		
09:35	MA52207-CCB1	1		
09:40	MA52207-CRI2	1		
09:45	MA52207-CRID1	1		
09:50	MA52207-ICSA1	1		
09:55	MA52207-ICSAB1	1		
10:00	MA52207-HSTD1	1		
10:06	MA52207-HSTD2	1		
10:11	ZZZZZZ	1		
10:16	ZZZZZZ	1		
10:21	ZZZZZZ	1		
10:27	MA52207-CCV1	1		
10:31	MA52207-CCB2	1		
10:37	MP32224-MB1	1		Zn RL raised 3X
10:42	MP32224-B1	1		
10:47	MP32224-S1	1		FE high
10:52	MP32224-S2	1		FE high
10:57	JD42497-24	1		FE high
11:02	MP32224-SD1	5		FE high
11:07	MP32224-PS1	1		FE high
11:12	JD42497-22	1		
11:17	JD42497-23	1		
11:22	MA52207-CCV2	1		
11:27	MA52207-CCB3	1		
11:32	JD42497-26	1		FE high
11:37	JD42497-27	1		AS high
11:42	JD42497-29	1		FE high
11:47	JD42497-30	1		AS high
-----> Last reportable sample/prep for job JD42497				

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:52	ZZZZZZ	1		
11:58	ZZZZZZ	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	5		
12:13	ZZZZZZ	1		
12:18	MA52207-CCV3	1		
12:23	MA52207-CCB4	1		
12:28	ZZZZZZ	1		
12:34	ZZZZZZ	1		
12:39	MP32222-B1	1		
12:43	MP32222-MB1	1		
12:49	ZZZZZZ	1		
12:54	MP32223-MB1	1		
12:59	MP32223-B1	1		
13:04	ZZZZZZ	1		
13:09	ZZZZZZ	1		
13:15	MA52207-CCV4	1		
13:20	MA52207-CCB5	1		
13:25	ZZZZZZ	1		
13:30	JD40449-12R	5		(sample used for QC only; not part of login JD42497)
13:35	MP32197-SD1	25		
13:40	ZZZZZZ	5		
13:45	ZZZZZZ	5		
13:51	ZZZZZZ	25		
13:56	ZZZZZZ	10		
14:01	ZZZZZZ	25		
14:06	ZZZZZZ	10		
14:11	ZZZZZZ	1		
14:16	MA52207-CCV5	1		
14:21	MA52207-CCB6	1		
14:26	MA52207-CRI3	1		
14:31	MA52207-ICSA2	1		
14:36	MA52207-ICSAB2	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:41	ZZZZZZ	25		
14:46	ZZZZZZ	5		
14:51	ZZZZZZ	10		
14:56	ZZZZZZ	5		
15:01	ZZZZZZ	5		
15:06	ZZZZZZ	5		
15:11	MA52207-CCV6	1		
15:16	MA52207-CCB7	1		
----->	Last reportable CCB for job JD42497			
15:21	ZZZZZZ	5		
15:26	ZZZZZZ	5		
15:31	ZZZZZZ	5		
15:36	ZZZZZZ	25		
15:41	MP32197-S1	5		
15:46	MP32197-S2	5		
15:51	ZZZZZZ	25		
15:56	ZZZZZZ	5		
16:01	ZZZZZZ	1		
16:06	MA52207-CCV7	1		
16:11	MA52207-CCB8	1		
16:16	ZZZZZZ	2		
16:21	ZZZZZZ	5		
16:26	ZZZZZZ	2		
16:31	ZZZZZZ	5		
16:36	ZZZZZZ	1		
16:41	ZZZZZZ	5		
16:46	ZZZZZZ	5		
16:51	ZZZZZZ	5		
16:56	ZZZZZZ	5		
17:01	ZZZZZZ	5		
17:06	MA52207-CCV8	1		
17:11	MA52207-CCB9	1		
17:16	ZZZZZZ	2		
17:21	ZZZZZZ	2		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:26	ZZZZZZ	1		
17:31	ZZZZZZ	1		
17:36	MP32222-B2	1		
17:41	MP32222-S1	1		IN out. Ca, Na, K high
17:46	MP32222-S2	1		IN out. Ca, Na, K high
17:51	JD42623-2A	1		(sample used for QC only; not part of login JD42497)
17:56	MP32222-SD1	5		IN out. Ca, Na, K high
18:02	MA52207-CCV9	1		
18:07	MA52207-CCB10	1		
18:12	ZZZZZZ	1		
18:17	ZZZZZZ	1		
18:22	ZZZZZZ	1		
18:27	ZZZZZZ	1		
18:32	ZZZZZZ	1		
18:37	ZZZZZZ	1		
18:42	ZZZZZZ	1		
18:47	ZZZZZZ	1		
18:52	ZZZZZZ	1		
18:57	MA52207-CCV10	1		
19:01	MA52207-CCB11	1		
19:07	ZZZZZZ	1		
19:12	ZZZZZZ	1		
19:17	ZZZZZZ	1		
19:22	ZZZZZZ	1		
19:27	ZZZZZZ	1		
19:32	ZZZZZZ	1		
19:37	ZZZZZZ	1		
19:42	MP32223-S1	1		
19:47	MP32223-S2	1		
19:52	MA52207-CCV11	1		
19:57	MA52207-CCB12	1		
20:02	JD42458-4	1		(sample used for QC only; not part of login JD42497)
20:07	MP32223-SD1	5		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:12	ZZZZZZ	1		
20:17	ZZZZZZ	1		
20:22	ZZZZZZ	1		
20:27	ZZZZZZ	1		
20:32	ZZZZZZ	1		
20:37	ZZZZZZ	1		
20:42	MA52207-CCV12	1		
20:47	MA52207-CCB13	1		
20:52	ZZZZZZ	1		
20:58	ZZZZZZ	1		
21:03	ZZZZZZ	1		
21:08	ZZZZZZ	1		
21:13	ZZZZZZ	1		
21:19	MA52207-CCV13	1		
21:23	MA52207-CCB14	1		
21:29	ZZZZZZ	1		
21:34	ZZZZZZ	1		
21:39	ZZZZZZ	1		
21:44	ZZZZZZ	1		
21:49	ZZZZZZ	1		
21:54	ZZZZZZ	1		
22:02	MA52207-CCV14	1		
22:07	MA52207-CCB15	1		
22:12	MP32237-MB1	1		
22:17	MP32237-B1	1		
22:23	MP32237-S1	1		
22:28	MP32237-S2	1		
22:33	JD42704-3	1		(sample used for QC only; not part of login JD42497)
22:38	MP32237-SD1	5		
22:43	ZZZZZZ	1		
22:48	ZZZZZZ	1		
22:54	ZZZZZZ	1		
22:59	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:04	MA52207-CCV15	1		
23:09	MA52207-CCB16	1		
23:14	ZZZZZZ	1		
23:19	ZZZZZZ	1		
23:24	ZZZZZZ	1		
23:29	ZZZZZZ	1		
23:34	ZZZZZZ	1		
23:39	ZZZZZZ	1		
23:44	ZZZZZZ	1		
23:50	ZZZZZZ	1		
23:55	ZZZZZZ	1		
00:00	MA52207-CCV16	1		
00:05	MA52207-CCB17	1		
00:10	MP32238-MB1	1		
00:15	MP32238-LB1	1		
00:20	MP32238-B1	1		
00:25	MP32238-LS1	1		
00:30	MP32238-S1	1		
00:35	MP32238-S2	1		
00:40	JD42585-1A	1		(sample used for QC only; not part of login JD42497)
00:45	MP32238-SD1	5		
00:53	MA52207-CCV17	1		
00:58	MA52207-CCB18	1		
01:03	MP32231-MB1	1		
01:08	MP32231-B1	1		
01:13	MP32231-S1	1		
01:18	MP32231-S2	1		
01:23	JD42710-12	1		(sample used for QC only; not part of login JD42497)
01:28	MP32231-SD1	5		
01:33	MP32231-PS1	1		
01:38	ZZZZZZ	1		
01:43	ZZZZZZ	1		
01:49	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
01:54	MA52207-CCV18	1		
01:59	MA52207-CCB19	1		
02:04	ZZZZZZ	1		
02:09	ZZZZZZ	1		
02:14	ZZZZZZ	1		
02:19	ZZZZZZ	1		
02:25	ZZZZZZ	1		
02:30	ZZZZZZ	1		
02:35	ZZZZZZ	1		
02:41	MP32226-MB1	1		
02:46	MP32226-B1	1		
02:51	MP32226-B2	1		
02:56	MA52207-CCV19	1		
03:01	MA52207-CCB20	1		
03:06	MP32226-S1	1		
03:11	MP32226-S2	1		
03:15	JD42726-8F	1		(sample used for QC only; not part of login JD42497)
03:20	MP32226-SD1	5		
03:26	ZZZZZZ	1		
03:31	ZZZZZZ	1		
03:36	ZZZZZZ	1		
03:41	ZZZZZZ	1		
03:46	ZZZZZZ	1		
03:51	ZZZZZZ	1		
03:56	MA52207-CCV20	1		
04:00	MA52207-CCB21	1		
04:06	ZZZZZZ	1		
04:11	ZZZZZZ	1		
04:16	ZZZZZZ	1		
04:21	ZZZZZZ	1		
04:26	ZZZZZZ	1		
04:31	MP32239-MB1	1		
04:36	MP32239-LB1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Dilution Factor	PS Recov	Comments
04:41	MP32239-B1	1		
04:46	MP32239-LS1	1		
04:51	MP32239-S1	1		
04:55	MA52207-CCV21	1		
05:00	MA52207-CCB22	1		
05:54	MP32239-S2	1		
05:58	JD42122-2R	1		(sample used for QC only; not part of login JD42497)
06:03	MP32239-SD1	5		
06:08	ZZZZZZ	1		
06:13	ZZZZZZ	1		
06:18	ZZZZZZ	1		
06:24	MA52207-CCV22	1		
06:28	MA52207-CCB23	1		
06:33	ZZZZZZ	5		
06:38	ZZZZZZ	25		
06:43	ZZZZZZ	5		
06:48	ZZZZZZ	25		
06:53	ZZZZZZ	5		
06:58	ZZZZZZ	5		
07:03	ZZZZZZ	5		
07:08	ZZZZZZ	5		
07:13	ZZZZZZ	2		
07:18	MA52207-CCV23	1		
07:23	MA52207-CCB24	1		
07:28	ZZZZZZ	5		
07:33	ZZZZZZ	5		
07:39	ZZZZZZ	5		
07:43	ZZZZZZ	10		
07:48	ZZZZZZ	20		
07:53	ZZZZZZ	5		
07:58	ZZZZZZ	10		
08:03	ZZZZZZ	50		
08:08	ZZZZZZ	5		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:13	ZZZZZZ	10		
08:18	MA52207-CCV24	1		
08:23	MA52207-CCB25	1		
08:28	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
09:08	MA52207-ICV1	1	X X
09:16	MA52207-ICB1	1	X X
09:21	MA52207-CRI1	1	
09:27	MA52207-ICCV1	1	X X
09:35	MA52207-CCB1	1	X X
09:40	MA52207-CRI2	1	X X
09:45	MA52207-CRID1	1	X X
09:50	MA52207-ICSA1	1	X X
09:55	MA52207-ICSAB1	1	X X
10:00	MA52207-HSTD1	1	X X
10:06	MA52207-HSTD2	1	X X
10:11	ZZZZZZ	1	
10:16	ZZZZZZ	1	
10:21	ZZZZZZ	1	
10:27	MA52207-CCV1	1	X X
10:31	MA52207-CCB2	1	X X
10:37	MP32224-MB1	1	X X
10:42	MP32224-B1	1	X X
10:47	MP32224-S1	1	
10:52	MP32224-S2	1	
10:57	JD42497-24	1	
11:02	MP32224-SD1	5	
11:07	MP32224-PS1	1	
11:12	JD42497-22	1	X X
11:17	JD42497-23	1	X X
11:22	MA52207-CCV2	1	X X
11:27	MA52207-CCB3	1	X X
11:32	JD42497-26	1	
11:37	JD42497-27	1	X
11:42	JD42497-29	1	
11:47	JD42497-30	1	X
11:52	ZZZZZZ	1	
11:58	ZZZZZZ	1	
		Element: A F s e	



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	5	
12:13	ZZZZZZ	1	
12:18	MA52207-CCV3	1	X X
12:23	MA52207-CCB4	1	X X
12:28	ZZZZZZ	1	
12:34	ZZZZZZ	1	
12:39	MP32222-B1	1	X X
12:43	MP32222-MB1	1	X X
12:49	ZZZZZZ	1	
12:54	MP32223-MB1	1	X X
12:59	MP32223-B1	1	X X
13:04	ZZZZZZ	1	
13:09	ZZZZZZ	1	
13:15	MA52207-CCV4	1	X X
13:20	MA52207-CCB5	1	X X
13:25	ZZZZZZ	1	
13:30	JD40449-12R	5	(a)
13:35	MP32197-SD1	25	
13:40	ZZZZZZ	5	
13:45	ZZZZZZ	5	
13:51	ZZZZZZ	25	
13:56	ZZZZZZ	10	
14:01	ZZZZZZ	25	
14:06	ZZZZZZ	10	
14:11	ZZZZZZ	1	
14:16	MA52207-CCV5	1	X X
14:21	MA52207-CCB6	1	X X
14:26	MA52207-CRI3	1	X X
14:31	MA52207-ICSA2	1	X X
14:36	MA52207-ICSAB2	1	X X
14:41	ZZZZZZ	25	
14:46	ZZZZZZ	5	
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
14:51	ZZZZZZ	10	
14:56	ZZZZZZ	5	
15:01	ZZZZZZ	5	
15:06	ZZZZZZ	5	
15:11	MA52207-CCV6	1	X X
15:16	MA52207-CCB7	1	X X
15:21	ZZZZZZ	5	
15:26	ZZZZZZ	5	
15:31	ZZZZZZ	5	
15:36	ZZZZZZ	25	
15:41	MP32197-S1	5	
15:46	MP32197-S2	5	
15:51	ZZZZZZ	25	
15:56	ZZZZZZ	5	
16:01	ZZZZZZ	1	
16:06	MA52207-CCV7	1	X X
16:11	MA52207-CCB8	1	X X
16:16	ZZZZZZ	2	
16:21	ZZZZZZ	5	
16:26	ZZZZZZ	2	
16:31	ZZZZZZ	5	
16:36	ZZZZZZ	1	
16:41	ZZZZZZ	5	
16:46	ZZZZZZ	5	
16:51	ZZZZZZ	5	
16:56	ZZZZZZ	5	
17:01	ZZZZZZ	5	
17:06	MA52207-CCV8	1	X X
17:11	MA52207-CCB9	1	X X
17:16	ZZZZZZ	2	
17:21	ZZZZZZ	2	
17:26	ZZZZZZ	1	
17:31	ZZZZZZ	1	
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
17:36	MP32222-B2	1	X X
17:41	MP32222-S1	1	X
17:46	MP32222-S2	1	X
17:51	JD42623-2A	1	(a)
17:56	MP32222-SD1	5	X
18:02	MA52207-CCV9	1	X X
18:07	MA52207-CCB10	1	X X
18:12	ZZZZZZ	1	
18:17	ZZZZZZ	1	
18:22	ZZZZZZ	1	
18:27	ZZZZZZ	1	
18:32	ZZZZZZ	1	
18:37	ZZZZZZ	1	
18:42	ZZZZZZ	1	
18:47	ZZZZZZ	1	
18:52	ZZZZZZ	1	
18:57	MA52207-CCV10	1	X X
19:01	MA52207-CCB11	1	X X
19:07	ZZZZZZ	1	
19:12	ZZZZZZ	1	
19:17	ZZZZZZ	1	
19:22	ZZZZZZ	1	
19:27	ZZZZZZ	1	
19:32	ZZZZZZ	1	
19:37	ZZZZZZ	1	
19:42	MP32223-S1	1	X X
19:47	MP32223-S2	1	X X
19:52	MA52207-CCV11	1	X X
19:57	MA52207-CCB12	1	X X
20:02	JD42458-4	1	(a)
20:07	MP32223-SD1	5	X X
20:12	ZZZZZZ	1	
20:17	ZZZZZZ	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52207  
Parameters: As,Fe

Time	Sample Description	Element: Dilution	A F s e
20:22	ZZZZZZ	1	
20:27	ZZZZZZ	1	
20:32	ZZZZZZ	1	
20:37	ZZZZZZ	1	
20:42	MA52207-CCV12	1	X X
20:47	MA52207-CCB13	1	X X
20:52	ZZZZZZ	1	
20:58	ZZZZZZ	1	
21:03	ZZZZZZ	1	
21:08	ZZZZZZ	1	
21:13	ZZZZZZ	1	
21:19	MA52207-CCV13	1	X X
21:23	MA52207-CCB14	1	X X
21:29	ZZZZZZ	1	
21:34	ZZZZZZ	1	
21:39	ZZZZZZ	1	
21:44	ZZZZZZ	1	
21:49	ZZZZZZ	1	
21:54	ZZZZZZ	1	
22:02	MA52207-CCV14	1	X X
22:07	MA52207-CCB15	1	X X
22:12	MP32237-MB1	1	X
22:17	MP32237-B1	1	X
22:23	MP32237-S1	1	X
22:28	MP32237-S2	1	X
22:33	JD42704-3	1	(a)
22:38	MP32237-SD1	5	X
22:43	ZZZZZZ	1	
22:48	ZZZZZZ	1	
22:54	ZZZZZZ	1	
22:59	ZZZZZZ	1	
23:04	MA52207-CCV15	1	X X
23:09	MA52207-CCB16	1	X X
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
23:14	ZZZZZZ	1	
23:19	ZZZZZZ	1	
23:24	ZZZZZZ	1	
23:29	ZZZZZZ	1	
23:34	ZZZZZZ	1	
23:39	ZZZZZZ	1	
23:44	ZZZZZZ	1	
23:50	ZZZZZZ	1	
23:55	ZZZZZZ	1	
00:00	MA52207-CCV16	1	X X
00:05	MA52207-CCB17	1	X X
00:10	MP32238-MB1	1	X
00:15	MP32238-LB1	1	
00:20	MP32238-B1	1	X
00:25	MP32238-LS1	1	X
00:30	MP32238-S1	1	X
00:35	MP32238-S2	1	X
00:40	JD42585-1A	1	X (a)
00:45	MP32238-SD1	5	X
00:53	MA52207-CCV17	1	X X
00:58	MA52207-CCB18	1	X X
01:03	MP32231-MB1	1	X X
01:08	MP32231-B1	1	X X
01:13	MP32231-S1	1	X X
01:18	MP32231-S2	1	X X
01:23	JD42710-12	1	(a)
01:28	MP32231-SD1	5	X X
01:33	MP32231-PS1	1	
01:38	ZZZZZZ	1	
01:43	ZZZZZZ	1	
01:49	ZZZZZZ	1	
01:54	MA52207-CCV18	1	X X
01:59	MA52207-CCB19	1	X X
		Element: A F s e	

# REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52207  
 Parameters: As,Fe

Time	Sample Description	Element: Dilution	A F s e
02:04	ZZZZZZ	1	
02:09	ZZZZZZ	1	
02:14	ZZZZZZ	1	
02:19	ZZZZZZ	1	
02:25	ZZZZZZ	1	
02:30	ZZZZZZ	1	
02:35	ZZZZZZ	1	
02:41	MP32226-MB1	1	X X
02:46	MP32226-B1	1	X X
02:51	MP32226-B2	1	X X
02:56	MA52207-CCV19	1	X X
03:01	MA52207-CCB20	1	X X
03:06	MP32226-S1	1	X X
03:11	MP32226-S2	1	X X
03:15	JD42726-8F	1	(a)
03:20	MP32226-SD1	5	X X
03:26	ZZZZZZ	1	
03:31	ZZZZZZ	1	
03:36	ZZZZZZ	1	
03:41	ZZZZZZ	1	
03:46	ZZZZZZ	1	
03:51	ZZZZZZ	1	
03:56	MA52207-CCV20	1	X X
04:00	MA52207-CCB21	1	X X
04:06	ZZZZZZ	1	
04:11	ZZZZZZ	1	
04:16	ZZZZZZ	1	
04:21	ZZZZZZ	1	
04:26	ZZZZZZ	1	
04:31	MP32239-MB1	1	
04:36	MP32239-LB1	1	
04:41	MP32239-B1	1	
04:46	MP32239-LS1	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	A F s e
04:51	MP32239-S1	1	
04:55	MA52207-CCV21	1	X X
05:00	MA52207-CCB22	1	X X
05:54	MP32239-S2	1	
05:58	JD42122-2R	1	(a)
06:03	MP32239-SD1	5	
06:08	ZZZZZZ	1	
06:13	ZZZZZZ	1	
06:18	ZZZZZZ	1	
06:24	MA52207-CCV22	1	X X
06:28	MA52207-CCB23	1	X X
06:33	ZZZZZZ	5	
06:38	ZZZZZZ	25	
06:43	ZZZZZZ	5	
06:48	ZZZZZZ	25	
06:53	ZZZZZZ	5	
06:58	ZZZZZZ	5	
07:03	ZZZZZZ	5	
07:08	ZZZZZZ	5	
07:13	ZZZZZZ	2	
07:18	MA52207-CCV23	1	X X
07:23	MA52207-CCB24	1	X X
07:28	ZZZZZZ	5	
07:33	ZZZZZZ	5	
07:39	ZZZZZZ	5	
07:43	ZZZZZZ	10	
07:48	ZZZZZZ	20	
07:53	ZZZZZZ	5	
07:58	ZZZZZZ	10	
08:03	ZZZZZZ	50	
08:08	ZZZZZZ	5	
08:13	ZZZZZZ	10	
08:18	MA52207-CCV24	1	X X
		Element: Dilution	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
 Analyst: ND      Run ID: MA52207  
 Parameters: As,Fe

Time	Sample Description	Dilution	Element: A F s e
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08:23 MA52207-CCB25 1 X X

08:28 ZZZZZZ 1

(a) Sample used for QC only; not part of login JD42497.

Element: A F s e



## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:58	MA52207-STD1	4232 R	247840 R	22303 R	10823 R
09:03	MA52207-STD2	4034	235420	21926	9638
09:08	MA52207-ICV1	4128	237160	22170	9959
09:16	MA52207-ICB1	4250	245850	22237	10831
09:21	MA52207-CRI1	No results reported for the elements associated with this internal standard.			
09:27	MA52207-ICCV1	4142	239930	22489	9954
09:35	MA52207-CCB1	4259	247620	22420	10832
09:40	MA52207-CRI2	4226	245820	22430	10629
09:45	MA52207-CRID1	4260	249120	22568	10800
09:50	MA52207-ICSA1	3880	221700	22080	8926
09:55	MA52207-ICSAB1	3865	220310	21853	8917
10:00	MA52207-HSTD1	4170	246740	22505	10545
10:06	MA52207-HSTD2	3912	225510	21922	8976
10:11	ZZZZZZ	4261	248750	22591	10933
10:16	ZZZZZZ	4248	251660	22761	10938
10:21	ZZZZZZ	4349	252320	22882	11054
10:27	MA52207-CCV1	4139	238270	22297	9904
10:31	MA52207-CCB2	4276	248580	22392	10814
10:37	MP32224-MB1	4304	251950	23063	10895
10:42	MP32224-B1	4179	244490	22582	10174
10:47	MP32224-S1	4216	241450	23685	10112
10:52	MP32224-S2	4289	248250	23792	10104
10:57	JD42497-24	4355	251860	24156	10370
11:02	MP32224-SD1	4296	249050	22849	10576
11:07	MP32224-PS1	4240	244770	23744	10112
11:12	JD42497-22	4259	243890	24072	9810
11:17	JD42497-23	4405	254410	24225	10249
11:22	MA52207-CCV2	4138	240540	22128	9947
11:27	MA52207-CCB3	4254	250160	22514	10793
11:32	JD42497-26	4343	249470	24027	9980
11:37	JD42497-27	4324	247170	24476	9543
11:42	JD42497-29	4289	247450	24302	10250
11:47	JD42497-30	4532	259360	24980	10091

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
11:52	ZZZZZZ	4300	246030	24311	9663
11:58	ZZZZZZ	4262	232390	24311	9339
12:03	ZZZZZZ	4359	247420	23726	10305
12:08	ZZZZZZ	3903	230200	22044	9417
12:13	ZZZZZZ	4542	258590	24592	10374
12:18	MA52207-CCV3	4147	238700	22507	9949
12:23	MA52207-CCB4	4275	251960	22756	10827
12:28	ZZZZZZ	4496	255160	24491	10360
12:34	ZZZZZZ	4429	255460	24140	10451
12:39	MP32222-B1	4168	244930	22890	10159
12:43	MP32222-MB1	4249	248220	22481	10784
12:49	ZZZZZZ	4253	250740	23025	10803
12:54	MP32223-MB1	4230	246900	22531	10777
12:59	MP32223-B1	4273	246770	23424	10449
13:04	ZZZZZZ	4306	251610	22932	11033
13:09	ZZZZZZ	4229	245850	22375	10768
13:15	MA52207-CCV4	4131	240700	22633	9968
13:20	MA52207-CCB5	4232	248000	22398	10768
13:25	ZZZZZZ	4234	246630	22384	10748
13:30	JD40449-12R	4068	241740	22604	10015
13:35	MP32197-SD1	4204	244370	22593	10533
13:40	ZZZZZZ	4100	239770	22253	10146
13:45	ZZZZZZ	4088	239320	22291	10058
13:51	ZZZZZZ	4154	240440	22220	10269
13:56	ZZZZZZ	4085	241960	22476	10091
14:01	ZZZZZZ	4143	245800	22528	10383
14:06	ZZZZZZ	4112	243410	22363	10269
14:11	ZZZZZZ	4238	247430	22476	10799
14:16	MA52207-CCV5	4105	240020	22137	9957
14:21	MA52207-CCB6	4219	246420	22436	10793
14:26	MA52207-CRI3	4162	244540	22309	10564
14:31	MA52207-ICSA2	3811	221300	21810	8926
14:36	MA52207-ICSAB2	3805	221030	21769	8926

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
14:41	ZZZZZZ	4084	243290	22051	10269
14:46	ZZZZZZ	4005	238380	21889	9924
14:51	ZZZZZZ	4028	240820	22085	10075
14:56	ZZZZZZ	3991	239670	22085	9977
15:01	ZZZZZZ	4016	240000	22025	10086
15:06	ZZZZZZ	4016	240240	21939	10093
15:11	MA52207-CCV6	4063	240320	22189	9964
15:16	MA52207-CCB7	4178	249130	22242	10812
15:21	ZZZZZZ	4126	247650	22337	10512
15:26	ZZZZZZ	4040	239050	21987	10087
15:31	ZZZZZZ	4064	242530	22273	10221
15:36	ZZZZZZ	4127	242770	22172	10304
15:41	MP32197-S1	4019	239600	22131	10006
15:46	MP32197-S2	4004	238230	22102	9967
15:51	ZZZZZZ	4108	242540	21979	10325
15:56	ZZZZZZ	4077	243110	22238	10272
16:01	ZZZZZZ	4214	250970	22694	10910
16:06	MA52207-CCV7	4072	240540	22263	9971
16:11	MA52207-CCB8	4191	249990	22403	10833
16:16	ZZZZZZ	4260	249420	23312	10540
16:21	ZZZZZZ	4170	246260	22661	10508
16:26	ZZZZZZ	4255	249140	23239	10489
16:31	ZZZZZZ	4239	251590	22923	10655
16:36	ZZZZZZ	4201	250160	22836	10866
16:41	ZZZZZZ	4204	247970	22781	10504
16:46	ZZZZZZ	4207	246470	22790	10517
16:51	ZZZZZZ	4211	248700	22718	10530
16:56	ZZZZZZ	4203	248970	22744	10497
17:01	ZZZZZZ	4164	246240	22742	10381
17:06	MA52207-CCV8	4094	242340	22523	9998
17:11	MA52207-CCB9	4216	250420	22711	10861
17:16	ZZZZZZ	4292	249820	23646	10266
17:21	ZZZZZZ	4310	248410	24037	10033

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
17:26	ZZZZZZ	4222	249260	22825	10873
17:31	ZZZZZZ	4122	244060	22772	10191
17:36	MP32222-B2	4129	243940	22782	10209
17:41	MP32222-S1	3123	185790	20163	7309 !a
17:46	MP32222-S2	3112	185360	20047	7286 !a
17:51	JD42623-2A	3087	182280	19823	7273 !a
17:56	MP32222-SD1	3670	215360	21408	8635
18:02	MA52207-CCV9	4092	242070	22416	10004
18:07	MA52207-CCB10	4196	249820	22430	10817
18:12	ZZZZZZ	4087	242540	22583	10143
18:17	ZZZZZZ	4086	242420	22452	10161
18:22	ZZZZZZ	4114	245560	22708	10319
18:27	ZZZZZZ	4102	244940	22504	10285
18:32	ZZZZZZ	4091	244370	22365	10286
18:37	ZZZZZZ	4133	246440	22558	10434
18:42	ZZZZZZ	3957	236800	22360	9819
18:47	ZZZZZZ	4060	244270	22348	10178
18:52	ZZZZZZ	4019	239450	22185	10004
18:57	MA52207-CCV10	4061	242380	22231	9998
19:01	MA52207-CCB11	4172	247230	22188	10812
19:07	ZZZZZZ	4101	243260	23274	9208
19:12	ZZZZZZ	3996	240760	22183	9970
19:17	ZZZZZZ	3103	183710	19891	7345 !a
19:22	ZZZZZZ	3752	218660	21642	8860
19:27	ZZZZZZ	3732	218510	21506	8845
19:32	ZZZZZZ	3743	217900	21726	8841
19:37	ZZZZZZ	3739	218390	21606	8833
19:42	MP32223-S1	4133	245010	22435	10195
19:47	MP32223-S2	4161	246340	22920	10225
19:52	MA52207-CCV11	4072	243830	22452	9997
19:57	MA52207-CCB12	4176	249400	22215	10824
20:02	JD42458-4	4132	246070	22489	10529
20:07	MP32223-SD1	4194	247420	22635	10784

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:12	ZZZZZZ	4257	252760	22978	11065
20:17	ZZZZZZ	4141	245850	22552	10527
20:22	ZZZZZZ	3873	226890	22136	9139
20:27	ZZZZZZ	3756	213370	22299	8532
20:32	ZZZZZZ	4023	239010	23004	9906
20:37	ZZZZZZ	4235	250760	23447	10576
20:42	MA52207-CCV12	4123	246750	23054	10055
20:47	MA52207-CCB13	4241	249880	22632	10952
20:52	ZZZZZZ	4242	254400	23105	10905
20:58	ZZZZZZ	4229	250040	22747	10891
21:03	ZZZZZZ	4259	253990	22894	10971
21:08	ZZZZZZ	3941	235650	22494	9681
21:13	ZZZZZZ	4387	242940	23932	10052
21:19	MA52207-CCV13	4144	246240	22950	10075
21:23	MA52207-CCB14	4250	252100	22577	10938
21:29	ZZZZZZ	4283	250290	23759	10667
21:34	ZZZZZZ	4218	248070	23348	10558
21:39	ZZZZZZ	4249	250420	23701	10706
21:44	ZZZZZZ	4228	249320	23507	10635
21:49	ZZZZZZ	4119	242550	22944	10217
21:54	ZZZZZZ	4143	244900	23294	10231
22:02	MA52207-CCV14	4153	245680	22851	10050
22:07	MA52207-CCB15	4264	253660	22797	10941
22:12	MP32237-MB1	4260	255690	23157	10959
22:17	MP32237-B1	4199	248590	23256	10356
22:23	MP32237-S1	4184	248730	23291	10275
22:28	MP32237-S2	4156	246590	23002	10179
22:33	JD42704-3	4152	245600	22946	10304
22:38	MP32237-SD1	4226	252020	22797	10738
22:43	ZZZZZZ	4250	251770	23260	10937
22:48	ZZZZZZ	4249	253460	23039	10947
22:54	ZZZZZZ	4243	254850	23088	10917
22:59	ZZZZZZ	4291	253440	23154	11039

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
23:04	MA52207-CCV15	4144	244430	22834	10092
23:09	MA52207-CCB16	4255	253420	22910	10929
23:14	ZZZZZZ	4227	252900	23217	10766
23:19	ZZZZZZ	4252	254610	23159	10804
23:24	ZZZZZZ	4030	239210	22671	9842
23:29	ZZZZZZ	4102	244710	22903	10077
23:34	ZZZZZZ	4131	244380	22909	10255
23:39	ZZZZZZ	4089	242550	22984	10021
23:44	ZZZZZZ	4091	242670	22882	10072
23:50	ZZZZZZ	4224	250870	23230	10693
23:55	ZZZZZZ	4170	245900	23247	10440
00:00	MA52207-CCV16	4145	242180	22690	10099
00:05	MA52207-CCB17	4248	252610	22681	10923
00:10	MP32238-MB1	4240	251870	22903	10928
00:15	MP32238-LB1	3809	216710	22101	8808
00:20	MP32238-B1	4191	248460	23054	10339
00:25	MP32238-LS1	3877	224040	22352	8754
00:30	MP32238-S1	3881	223720	22230	8761
00:35	MP32238-S2	3969	227810	22264	8909
00:40	JD42585-1A	3927	222470	22742	9001
00:45	MP32238-SD1	4108	240970	23173	9854
00:53	MA52207-CCV17	4137	244580	22487	10074
00:58	MA52207-CCB18	4236	250330	22642	10898
01:03	MP32231-MB1	4233	253850	23000	10922
01:08	MP32231-B1	4153	246190	22976	10294
01:13	MP32231-S1	4348	252420	24056	10055
01:18	MP32231-S2	4369	253200	24097	10021
01:23	JD42710-12	4454	257460	24055	10473
01:28	MP32231-SD1	4261	252250	22806	10712
01:33	MP32231-PS1	4324	252380	23860	10115
01:38	ZZZZZZ	4137	241240	23016	10500
01:43	ZZZZZZ	No results reported for the elements associated with this internal standard.			
01:49	ZZZZZZ	No results reported for the elements associated with this internal standard.			

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
01:54	MA52207-CCV18	4077	242710	22309	10022
01:59	MA52207-CCB19	4190	250330	22448	10889
02:04	ZZZZZZ	4431	257100	24948	10197
02:09	ZZZZZZ	4461	260760	25160	10083
02:14	ZZZZZZ	4324	250920	24049	10168
02:19	ZZZZZZ	4505	262520	25456	10227
02:25	ZZZZZZ	4245	249940	23740	10138
02:30	ZZZZZZ	4250	250820	23861	10080
02:35	ZZZZZZ	No results reported for the elements associated with this internal standard.			
02:41	MP32226-MB1	4209	254250	22664	10968
02:46	MP32226-B1	4113	246580	22554	10303
02:51	MP32226-B2	4114	245180	22502	10314
02:56	MA52207-CCV19	4072	243550	22175	10095
03:01	MA52207-CCB20	4179	250890	22519	10923
03:06	MP32226-S1	4053	244030	22258	10097
03:11	MP32226-S2	4050	243030	22230	10113
03:15	JD42726-8F	4107	248020	22484	10529
03:20	MP32226-SD1	4147	249060	22293	10829
03:26	ZZZZZZ	4057	244120	22349	10453
03:31	ZZZZZZ	4098	247890	22270	10566
03:36	ZZZZZZ	4041	245270	22307	10438
03:41	ZZZZZZ	4073	245830	22344	10520
03:46	ZZZZZZ	4115	248770	22297	10782
03:51	ZZZZZZ	4115	249350	22154	10720
03:56	MA52207-CCV20	4036	240980	21869	10041
04:00	MA52207-CCB21	4167	250540	22146	10905
04:06	ZZZZZZ	4109	249750	22219	10753
04:11	ZZZZZZ	3891	229490	21857	9435
04:16	ZZZZZZ	4030	241830	22098	10327
04:21	ZZZZZZ	3982	237300	21976	9874
04:26	ZZZZZZ	4007	241300	21992	10102
04:31	MP32239-MB1	4135	248550	22144	10890
04:36	MP32239-LB1	4136	249960	22396	10874

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
04:41	MP32239-B1	4080	245710	22385	10268
04:46	MP32239-LS1	4080	244530	22613	10275
04:51	MP32239-S1	4070	244470	22381	10226
04:55	MA52207-CCV21	4042	242950	22283	10039
05:00	MA52207-CCB22	4161	250270	22500	10915
05:54	MP32239-S2	4013	241620	22006	10037
05:58	JD42122-2R	4093	246030	22231	10595
06:03	MP32239-SD1	4118	245810	22121	10759
06:08	ZZZZZZ	4083	247820	22185	10601
06:13	ZZZZZZ	4121	247080	22186	10707
06:18	ZZZZZZ	4118	248340	22318	10658
06:24	MA52207-CCV22	4019	240370	21965	9987
06:28	MA52207-CCB23	4131	249280	22076	10827
06:33	ZZZZZZ	3945	237610	21795	10024
06:38	ZZZZZZ	4004	239950	21870	10305
06:43	ZZZZZZ	3970	238930	21827	10020
06:48	ZZZZZZ	4036	242930	22023	10336
06:53	ZZZZZZ	3983	240310	21979	10149
06:58	ZZZZZZ	3964	238530	21864	10052
07:03	ZZZZZZ	3968	239170	21888	10094
07:08	ZZZZZZ	3980	239700	21877	10103
07:13	ZZZZZZ	4022	242460	22095	10258
07:18	MA52207-CCV23	4044	240960	21956	10007
07:23	MA52207-CCB24	4154	248830	22066	10853
07:28	ZZZZZZ	3984	240380	21933	10111
07:33	ZZZZZZ	4036	242280	22072	10310
07:39	ZZZZZZ	3992	240850	21916	10137
07:43	ZZZZZZ	3941	234820	21744	9794
07:48	ZZZZZZ	4005	239520	21873	10015
07:53	ZZZZZZ	4007	239870	22003	10142
07:58	ZZZZZZ	3986	236260	21906	9865
08:03	ZZZZZZ	4034	239440	21982	10049
08:08	ZZZZZZ	4067	243500	22134	10335



## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:13	ZZZZZZ	3976	239970	21971	10076
08:18	MA52207-CCV24	4066	242350	22073	10019
08:23	MA52207-CCB25	4172	251020	22147	10869
08:28	ZZZZZZ	4174	249020	22577	10886

R = Reference for ISTD limits.    ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

(a) No samples reported for the elements associated with this internal standard.

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52207 Units: ug/l

Time: Sample ID:			09:16 ICB1		09:35 CCB1		10:31 CCB2		11:27 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	-0.800	<3.0	-0.900	<3.0	0.500	<3.0	-0.300	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1	anr							
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	-10.3	<100	-6.70	<100	-4.50	<100	-0.200	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3	anr							
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52207 Units: ug/l

Time: Sample ID:			09:16 ICB1		09:35 CCB1		10:31 CCB2		11:27 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final

Zinc 20 .2 anr

Zirconium 10 .5

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.3

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52207 Units: ug/l

Time: Sample ID:			12:23 CCB4		13:20 CCB5		14:21 CCB6		15:16 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.600	<3.0	0.200	<3.0	-0.200	<3.0	0.00	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1	anr							
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	-2.70	<100	-6.10	<100	-6.10	<100	-5.20	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3	anr							
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52207 Units: ug/l

Time: Sample ID:			12:23 CCB4		13:20 CCB5		14:21 CCB6		15:16 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.2	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52207 Units: ug/l

Time:		09:27	
Sample ID:		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1960	98.0
Barium	anr		
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40000	100.0
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52207      Units: ug/l

Time:		09:27	
Sample ID:		ICCV	
Metal		True	
		Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time: Sample ID:		09:08 ICV1		10:27 CCV1		11:22 CCV2			
Metal	ICV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1970	98.5	2000	1960	98.0	2000	1950	97.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron	anr								
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	39900	99.8	40000	39800	99.5	40000	39600	99.0
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon	anr								
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:		09:08		10:27		11:22			
Sample ID:	ICV	ICV1		CCV	CCV1	CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time: Sample ID:		12:18 CCV3		13:15 CCV4		14:16 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1950	97.5	2000	1960	98.0	2000	1960	98.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron	anr								
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	39500	98.8	40000	39700	99.3	40000	39300	98.3
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon	anr								
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:		12:18			13:15			14:16		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time: Sample ID: CCV		15:11 CCV6		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	anr			
Arsenic	2000	1960	98.0	
Barium	anr			
Beryllium	anr			
Bismuth				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	40000	39300	98.3	
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon	anr			
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

6.2.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:	15:11
Sample ID:	CCV
	CCV6
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

## HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		10:00		10:06		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	anr					
Arsenic	8000	7490	93.6			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron	anr					
Cadmium	anr					
Calcium						
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron				200000	195000	97.5
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon	anr					
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52207      Units: ug/l

Time:		10:00		10:06	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52207 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	09:40 CRI2		09:45 CRID1		14:26 CRI3	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	8.80	110.0	2.40	80.0	8.40	105.0
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10	anr					
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		92.4	92.4			94.6	94.6
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200			anr					
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52207 Units: ug/l

Time:					09:40		09:45		14:26	
Sample ID:	CRI	CRIA	CRID	CRI2			CRID1		CRID3	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52207      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	09:50 ICSAB1 Results	% Rec	09:55 ICSAB1 Results	% Rec	14:31 ICSAB2 Results	% Rec	14:36 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	484000	96.8	489000	97.8	484000	96.8	498000	99.6
Antimony		1000	5.00		1010	101.0	1.40		1010	101.0
Arsenic		1000	2.50		1000	100.0	0.600		1010	101.0
Barium		500	-44.2		440	88.0	-44.3		447	89.4
Beryllium		500	0.100		475	95.0	0.00		484	96.8
Bismuth		500	11.4		487	97.4	7.80		487	97.4
Boron		500	-8.30		470	94.0	-7.20		469	93.8
Cadmium		1000	1.50		986	98.6	2.40		1010	101.0
Calcium	400000	400000	364000	91.0	382000	95.5	376000	94.0	388000	97.0
Cerium			40.8		522*		43.4		533*	
Chromium		500	1.60		470	94.0	1.60		469	93.8
Cobalt		500	2.30		470	94.0	2.40		468	93.6
Copper		500	-0.200		494	98.8	-1.60		495	99.0
Iron	200000	200000	190000	95.0	199000	99.5	189000	94.5	198000	99.0
Lead		1000	-1.20		932	93.2	0.300		920	92.0
Lithium		500	-6.60		536	107.2	-4.20		542	108.4
Magnesium	500000	500000	485000	97.0	487000	97.4	491000	98.2	490000	98.0
Manganese		500	1.30		498	99.6	1.20		506	101.2
Molybdenum		500	-3.10		464	92.8	-2.10		467	93.4
Nickel		1000	4.10		934	93.4	4.50		920	92.0
Phosphorus		500	13.7		481	96.2	6.60		481	96.2
Potassium			-42.6		-70.2		-200		-168	
Selenium		1000	1.40		921	92.1	-1.00		928	92.8
Silicon		500	-21.5		494	98.8	-19.4		492	98.4
Silver		1000	2.80		1080	108.0	0.00		1080	108.0
Sodium			-84.8		-85.3		-116		-122	
Strontium		500	1.20		483	96.6	1.20		488	97.6
Sulfur		500	-32.6		452	90.4	-34.8		451	90.2
Thallium		1000	-6.40		934	93.4	-5.50		930	93.0
Tin		500	-8.30		452	90.4	-8.00		455	91.0
Titanium		500	-1.00		479	95.8	-1.00		480	96.0
Tungsten		500	-1.50		477	95.4	-1.80		484	96.8
Vanadium		500	-4.40		469	93.8	-3.40		470	94.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52207 Units: ug/l

Time:				09:50			09:55			14:31			14:36
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	1.60			919	91.9	1.60		931	93.1		
Zirconium		500	2.40			471	94.2	1.90		476	95.2		

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.8

6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52215  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:36	MA52215-STD1	1		STDA
06:41	MA52215-STD2	1		STDB
06:46	MA52215-ICV1	1		
06:54	MA52215-ICB1	1		
07:07	MA52215-ICCV1	1		
07:56	MA52215-CCB1	1		
08:00	MA52215-CRID1	1		
08:06	MA52215-CRI1	1		
08:10	MA52215-ICSA1	1		
08:16	MA52215-ICSAB1	1		
08:21	MA52215-HSTD1	1		
08:26	MA52215-HSTD2	1		
08:32	ZZZZZZ	1		
08:37	ZZZZZZ	1		
08:42	ZZZZZZ	1		
08:47	MA52215-CCV1	1		
08:51	MA52215-CCB2	1		
08:56	ZZZZZZ	1		
09:01	ZZZZZZ	1		
09:06	MP32224-S1	5		
09:11	MP32224-S2	5		
09:15	JD42497-24	5		
09:20	MP32224-SD1	25		
09:25	MP32224-PS1	5		
09:30	JD42497-26	2		
09:35	MA52215-CCV2	1		
09:40	MA52215-CCB3	1		
09:45	JD42497-27	20		
09:50	JD42497-29	5		
09:54	JD42497-30	10		
09:59	ZZZZZZ	5		
10:04	ZZZZZZ	5		
10:09	MP32230-B1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52215  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:14	MP32230-MB1	1		
10:19	MP32230-S1	1		
10:24	MP32230-S2	1		
10:28	MA52215-CCV3	1		
10:33	MA52215-CCB4	1		
10:38	MA52215-CRI2	1		
10:43	JD42431-4	1		(sample used for QC only; not part of login JD42497)
10:48	MP32230-SD1	5		
10:53	ZZZZZZ	1		
10:58	ZZZZZZ	1		
11:03	ZZZZZZ	1		
11:08	ZZZZZZ	1		
11:13	ZZZZZZ	1		
11:18	ZZZZZZ	1		
11:23	MA52215-CCV4	1		
11:28	MA52215-CCB5	1		
11:33	MA52215-ICSA2	1		
11:38	MA52215-ICSAB2	1		
11:43	ZZZZZZ	1		
11:48	ZZZZZZ	25		
11:53	ZZZZZZ	1		
11:58	ZZZZZZ	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	20		
12:13	ZZZZZZ	5		
12:18	MA52215-CCV5	1		
12:23	MA52215-CCB6	1		
12:28	MP32222-S1	2		
12:33	MP32222-S2	2		
12:38	JD42623-2A	2		(sample used for QC only; not part of login JD42497)
12:43	MP32222-SD1	10		
12:49	MP32222-S1	25		
12:54	MP32222-S2	25		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52215  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:59	JD42623-2A	25		(sample used for QC only; not part of login JD42497)
13:04	MP32222-SD1	125		
13:09	ZZZZZZ	50		
13:14	MA52215-CCV6	1		
13:19	MA52215-CCB7	1		
13:24	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:34	ZZZZZZ	1		
13:39	ZZZZZZ	1		
13:44	ZZZZZZ	1		
13:49	MP32248-MB1	1		
13:54	MP32248-B1	1		
----->	Last reportable sample/prep for job JD42497			
13:59	JD42748-1	1		(sample used for QC only; not part of login JD42497)
14:04	MA52215-CCV7	1		
14:09	MA52215-CCB8	1		
----->	Last reportable CCB for job JD42497			
	Refer to raw data for calibration curve and standards.			

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Element: Dilution	A F s e
06:46	MA52215-ICV1	1	X X
06:54	MA52215-ICB1	1	X X
07:07	MA52215-ICCV1	1	X X
07:56	MA52215-CCB1	1	X X
08:00	MA52215-CRID1	1	X X
08:06	MA52215-CRI1	1	X X
08:10	MA52215-ICSA1	1	X X
08:16	MA52215-ICSAB1	1	X X
08:21	MA52215-HSTD1	1	X X
08:26	MA52215-HSTD2	1	X X
08:32	ZZZZZZ	1	
08:37	ZZZZZZ	1	
08:42	ZZZZZZ	1	
08:47	MA52215-CCV1	1	X X
08:51	MA52215-CCB2	1	X X
08:56	ZZZZZZ	1	
09:01	ZZZZZZ	1	
09:06	MP32224-S1	5	X X
09:11	MP32224-S2	5	X X
09:15	JD42497-24	5	X X
09:20	MP32224-SD1	25	X X
09:25	MP32224-PS1	5	X
09:30	JD42497-26	2	X X
09:35	MA52215-CCV2	1	X X
09:40	MA52215-CCB3	1	X X
09:45	JD42497-27	20	X
09:50	JD42497-29	5	X X
09:54	JD42497-30	10	X
09:59	ZZZZZZ	5	
10:04	ZZZZZZ	5	
10:09	MP32230-B1	1	X X
10:14	MP32230-MB1	1	X X
10:19	MP32230-S1	1	X X
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Element: Dilution	A F s e
10:24	MP32230-S2	1	X X
10:28	MA52215-CCV3	1	X X
10:33	MA52215-CCB4	1	X X
10:38	MA52215-CRI2	1	X X
10:43	JD42431-4	1	(a)
10:48	MP32230-SD1	5	X X
10:53	ZZZZZZ	1	
10:58	ZZZZZZ	1	
11:03	ZZZZZZ	1	
11:08	ZZZZZZ	1	
11:13	ZZZZZZ	1	
11:18	ZZZZZZ	1	
11:23	MA52215-CCV4	1	X X
11:28	MA52215-CCB5	1	X X
11:33	MA52215-ICSA2	1	X X
11:38	MA52215-ICSAB2	1	X X
11:43	ZZZZZZ	1	
11:48	ZZZZZZ	25	
11:53	ZZZZZZ	1	
11:58	ZZZZZZ	1	
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	20	
12:13	ZZZZZZ	5	
12:18	MA52215-CCV5	1	X X
12:23	MA52215-CCB6	1	X X
12:28	MP32222-S1	2	X
12:33	MP32222-S2	2	X
12:38	JD42623-2A	2	(a)
12:43	MP32222-SD1	10	X
12:49	MP32222-S1	25	
12:54	MP32222-S2	25	
12:59	JD42623-2A	25	(a)
13:04	MP32222-SD1	125	
		Element:	A F s e



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52215  
Parameters: As,Fe

Time	Sample Description	Dilution	Element: A F s e
13:09	ZZZZZZ	50	
13:14	MA52215-CCV6	1	X X
13:19	MA52215-CCB7	1	X X
13:24	ZZZZZZ	1	
13:29	ZZZZZZ	1	
13:34	ZZZZZZ	1	
13:39	ZZZZZZ	1	
13:44	ZZZZZZ	1	
13:49	MP32248-MB1	1	
13:54	MP32248-B1	1	
13:59	JD42748-1	1	(a)
14:04	MA52215-CCV7	1	X X
14:09	MA52215-CCB8	1	X X

(a) Sample used for QC only; not part of login JD42497.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:36	MA52215-STD1	6357 R	198520 R	20417 R	10988 R
06:41	MA52215-STD2	6060	185260	20705	9777
06:46	MA52215-ICV1	6263	191380	20927	10188
06:54	MA52215-ICB1	6465	201510	20911	11166
07:07	MA52215-ICCV1	6262	192150	20950	10224
07:56	MA52215-CCB1	6474	202330	21021	11210
08:00	MA52215-CRID1	6455	201650	20920	11159
08:06	MA52215-CRI1	6435	200340	20980	10998
08:10	MA52215-ICSA1	5845	176930	20612	9151
08:16	MA52215-ICSAB1	5855	177300	20692	9167
08:21	MA52215-HSTD1	6330	195490	20946	10950
08:26	MA52215-HSTD2	5884	179730	20648	9149
08:32	ZZZZZZ	6295	197000	20922	11045
08:37	ZZZZZZ	6309	200560	20880	11185
08:42	ZZZZZZ	6433	199920	20800	11212
08:47	MA52215-CCV1	6308	192990	20999	10268
08:51	MA52215-CCB2	6484	202680	21087	11198
08:56	ZZZZZZ	6513	203140	21065	11257
09:01	ZZZZZZ	6408	197490	21203	10598
09:06	MP32224-S1	6548	200540	21406	10891
09:11	MP32224-S2	6517	199890	21182	10881
09:15	JD42497-24	6579	202240	21526	11028
09:20	MP32224-SD1	6539	203070	21228	11171
09:25	MP32224-PS1	6549	200700	21464	10863
09:30	JD42497-26	6522	200830	21929	10530
09:35	MA52215-CCV2	6331	194260	21122	10314
09:40	MA52215-CCB3	6535	203630	20965	11281
09:45	JD42497-27	6573	203170	21197	11073
09:50	JD42497-29	6514	201360	21291	10890
09:54	JD42497-30	6597	202890	21373	11057
09:59	ZZZZZZ	6492	199830	21303	10680
10:04	ZZZZZZ	6450	199900	21426	10431
10:09	MP32230-B1	6223	190410	20638	10376

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:14	MP32230-MB1	6362	197770	20585	11109
10:19	MP32230-S1	6142	187450	20583	9979
10:24	MP32230-S2	6086	186390	20567	9926
10:28	MA52215-CCV3	6344	194710	21160	10335
10:33	MA52215-CCB4	6571	205010	21241	11318
10:38	MA52215-CRI2	6526	202500	21003	11117
10:43	JD42431-4	6105	189350	20367	10288
10:48	MP32230-SD1	6464	201610	21170	11058
10:53	ZZZZZZ	6138	189870	20450	10302
10:58	ZZZZZZ	6225	193280	20770	10520
11:03	ZZZZZZ	6268	193000	20620	10597
11:08	ZZZZZZ	5864	179650	20435	9319
11:13	ZZZZZZ	5683	174070	20087	8889
11:18	ZZZZZZ	6104	187610	20432	9978
11:23	MA52215-CCV4	6371	195080	21069	10343
11:28	MA52215-CCB5	6557	203580	20975	11267
11:33	MA52215-ICSA2	5907	178650	20606	9189
11:38	MA52215-ICSAB2	5914	179260	20635	9224
11:43	ZZZZZZ	6233	191720	20381	10377
11:48	ZZZZZZ	6349	198190	20778	10612
11:53	ZZZZZZ	6574	204460	21011	11298
11:58	ZZZZZZ	6419	195440	22320	9522
12:03	ZZZZZZ	6424	199130	20479	11198
12:08	ZZZZZZ	6385	196390	20835	10527
12:13	ZZZZZZ	6491	199920	21316	10476
12:18	MA52215-CCV5	6382	194610	20932	10369
12:23	MA52215-CCB6	6564	204740	20968	11306
12:28	MP32222-S1	5162	160320	19778	7889
12:33	MP32222-S2	5149	160640	19766	7870
12:38	JD42623-2A	5156	159780	19788	7922
12:43	MP32222-SD1	5876	182190	20515	9290
12:49	MP32222-S1	6178	191440	20705	9999
12:54	MP32222-S2	6107	189400	20386	9930

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:59	JD42623-2A	6090	189220	20239	9909
13:04	MP32222-SD1	6413	198930	20597	10788
13:09	ZZZZZZ	6303	194850	20469	10386
13:14	MA52215-CCV6	6356	195300	20648	10316
13:19	MA52215-CCB7	6586	204940	20802	11309
13:24	ZZZZZZ	6463	198640	21159	10636
13:29	ZZZZZZ	6628	207750	21123	11387
13:34	ZZZZZZ	6612	205290	20847	11292
13:39	ZZZZZZ	6625	204130	20820	11299
13:44	ZZZZZZ	6603	206760	20502	11382
13:49	MP32248-MB1	6621	208210	21028	11374
13:54	MP32248-B1	6486	199770	20874	10662
13:59	JD42748-1	6419	198960	21890	9794
14:04	MA52215-CCV7	6441	194790	20567	10414
14:09	MA52215-CCB8	6567	205690	20618	11258

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52215 Units: ug/l

Time: Sample ID:			06:54 ICB1		07:56 CCB1		08:51 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	-0.100	<3.0	0.00	<3.0	-0.200	<3.0	-0.600	<3.0
Barium	200	.8								
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3	anr							
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4								
Copper	10	.8	anr							
Iron	100	5.3	-0.300	<100	-2.90	<100	5.00	<100	-2.40	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52215 Units: ug/l

Time: Sample ID:			06:54 ICB1		07:56 CCB1		08:51 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52215 Units: ug/l

Time: Sample ID:			10:33 CCB4		11:28 CCB5		12:23 CCB6		13:19 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.100	<3.0	0.600	<3.0	0.500	<3.0	-0.200	<3.0
Barium	200	.8								
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3	anr							
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4								
Copper	10	.8	anr							
Iron	100	5.3	2.30	<100	4.00	<100	5.70	<100	4.60	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52215 Units: ug/l

Time: Sample ID:			10:33 CCB4		11:28 CCB5		12:23 CCB6		13:19 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52215 Units: ug/l

Time: Sample ID:		14:09 CCB8		
Metal	RL	IDL	raw	final
Aluminum	200	17	anr	
Antimony	6.0	1.7	anr	
Arsenic	3.0	2.1	0.200	<3.0
Barium	200	.8		
Beryllium	1.0	.3	anr	
Bismuth	20	2.3		
Boron	100	2.3	anr	
Cadmium	3.0	.3	anr	
Calcium	5000	6.6	anr	
Cerium	100			
Chromium	10	.3	anr	
Cobalt	50	.4		
Copper	10	.8	anr	
Iron	100	5.3	5.70	<100
Lead	3.0	1.1	anr	
Lithium	50	4.8		
Magnesium	5000	32		
Manganese	15	.1	anr	
Molybdenum	20	.6		
Nickel	10	.4	anr	
Phosphorus	50	1.2		
Potassium	10000	77	anr	
Selenium	10	3.2	anr	
Silicon	200	1.7		
Silver	10	1	anr	
Sodium	10000	34	anr	
Strontium	10	.3		
Sulfur	50	3	anr	
Thallium	10	1.8	anr	
Tin	10	.8		
Titanium	10	.5		
Tungsten	50	2.6		
Vanadium	50	.6		

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52215      Units: ug/l

Time:		14:09		
Sample ID:		CCB8		
Metal	RL	IDL	raw	final

Zinc                      20                      .1                      anr

Zirconium              10                      .3

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.3

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52215 Units: ug/l

Time:		07:07	
Sample ID:		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1950	97.5
Barium			
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt			
Copper	anr		
Iron	40000	39900	99.8
Lead	anr		
Lithium			
Magnesium			
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium			

6.3.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52215      Units: ug/l

Time:	07:07
Sample ID:	ICCV
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time: Sample ID:		ICV	06:46 ICV1		% Rec		CCV	08:47 CCV1		% Rec		CCV	09:35 CCV2		% Rec	
Metal		True	Results		% Rec	True		Results		% Rec	True		Results		% Rec	
Aluminum		anr														
Antimony		anr														
Arsenic		2000	1960		98.0	2000		1970		98.5	2000		1950		97.5	
Barium																
Beryllium		anr														
Bismuth																
Boron		anr														
Cadmium		anr														
Calcium		anr														
Cerium																
Chromium		anr														
Cobalt																
Copper		anr														
Iron		40000	39900		99.8	40000		39500		98.8	40000		37600		94.0	
Lead		anr														
Lithium																
Magnesium																
Manganese		anr														
Molybdenum																
Nickel		anr														
Phosphorus																
Potassium		anr														
Selenium		anr														
Silicon																
Silver		anr														
Sodium		anr														
Strontium																
Sulfur		anr														
Thallium		anr														
Tin																
Titanium																
Tungsten																
Vanadium																

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time:		06:46			08:47			09:35		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time: Sample ID:		10:28 CCV3		11:23 CCV4		12:18 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1930	96.5	2000	1930	96.5	2000	1940	97.0
Barium									
Beryllium	anr								
Bismuth									
Boron	anr								
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt									
Copper	anr								
Iron	40000	37500	93.8	40000	37800	94.5	40000	38100	95.3
Lead	anr								
Lithium									
Magnesium									
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur	anr								
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time:		10:28			11:23			12:18		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.5

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time: Sample ID:		13:14 CCV6		14:04 CCV7		
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	2000	1910	95.5	2000	1890	94.5
Barium						
Beryllium	anr					
Bismuth						
Boron	anr					
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron	40000	37500	93.8	40000	37400	93.5
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur	anr					
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium						

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time:		13:14			14:04		
Sample ID:	CCV	CCV6	CCV		CCV7		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.5

6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52215 Units: ug/l

Time:		08:21			08:26		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	8000	7430	92.9				
Barium							
Beryllium	anr						
Bismuth							
Boron	anr						
Cadmium	anr						
Calcium							
Cerium							
Chromium	anr						
Cobalt							
Copper	anr						
Iron				200000	189000	94.5	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur	anr						
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium							

HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery      Run ID: MA52215      Units: ug/l

Time:		08:21		08:26		
Sample ID:		HSTD1		HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.3.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52215 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	08:00 CRID1		08:06 CRI1		10:38 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	3.10	103.3	7.30	91.3	7.90	98.8
Barium	200		4.0						
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				106	106.0	101	101.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52215 Units: ug/l

Time:					08:00		08:06		10:38	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.3.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52215      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	08:10 ICSAB1 Results	% Rec	08:16 ICSAB1 Results	% Rec	11:33 ICSAB2 Results	% Rec	11:38 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	488000	97.6	490000	98.0	480000	96.0	487000	97.4
Antimony		1000	-1.80		959	95.9	0.100		944	94.4
Arsenic		1000	-0.600		962	96.2	0.500		938	93.8
Barium		500	6.20		470	94.0	6.20		459	91.8
Beryllium		500	0.100		461	92.2	0.100		452	90.4
Bismuth		500	-10.3		434	86.8	-11.2		422	84.4
Boron		500	1.10		455	91.0	1.80		449	89.8
Cadmium		1000	0.500		973	97.3	0.400		953	95.3
Calcium	400000	400000	370000	92.5	375000	93.8	355000	88.8	366000	91.5
Cerium			18.9		486*		17.5		479*	
Chromium		500	-1.70		450	90.0	-1.80		440	88.0
Cobalt		500	0.800		463	92.6	0.800		455	91.0
Copper		500	-2.90		482	96.4	-3.20		464	92.8
Iron	200000	200000	186000	93.0	194000	97.0	180000	90.0	189000	94.5
Lead		1000	1.40		888	88.8	0.800		877	87.7
Lithium		500	-8.50		533	106.6	-7.30		523	104.6
Magnesium	500000	500000	484000	96.8	472000	94.4	470000	94.0	461000	92.2
Manganese		500	0.900		482	96.4	0.700		472	94.4
Molybdenum		500	-2.50		458	91.6	-2.10		447	89.4
Nickel		1000	0.00		891	89.1	0.00		878	87.8
Phosphorus		500	-5.60		447	89.4	-8.50		441	88.2
Potassium			-536		-537		-554		-547	
Selenium		1000	1.80		878	87.8	-1.70		855	85.5
Silicon		500	5.60		504	100.8	9.80		496	99.2
Silver		1000	4.30		1020	102.0	4.20		996	99.6
Sodium			69.0		90.1		167		166	
Strontium		500	-0.900		468	93.6	-0.800		457	91.4
Sulfur		500	-25.2		424	84.8	-24.0		419	83.8
Thallium		1000	-4.50		879	87.9	-5.70		866	86.6
Tin		500	-5.50		442	88.4	-5.90		433	86.6
Titanium		500	-1.60		463	92.6	-1.50		457	91.4
Tungsten		500	-2.40		470	94.0	-0.300		461	92.2
Vanadium		500	-2.60		464	92.8	-1.90		457	91.4

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52215 Units: ug/l

Time:				08:10			08:16			11:33			11:38
Sample ID:	ICSA	ICSAB	ICSA1			ICSAB1		ICSA2		ICSAB2			
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc		1000	2.90		895	89.5	2.40		874	87.4
Zirconium		500	0.500		434	86.8	0.00		423	84.6

(\*) Outside of QC limits  
(anr) Analyte not requested



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52222  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:01	MA52222-STD1	1		STDA
06:06	MA52222-STD2	1		STDB
06:11	MA52222-ICV1	1		
06:16	MA52222-ICB1	1		
06:23	MA52222-ICCV1	1		
06:36	MA52222-CCB1	1		
06:42	MA52222-CRID1	1		
06:48	MA52222-CRI1	1		
06:52	MA52222-ICSA1	1		
06:58	MA52222-ICSAB1	1		
07:03	MA52222-HSTD1	1		
07:08	MA52222-HSTD2	1		
07:14	ZZZZZZ	1		
07:19	ZZZZZZ	1		
07:24	MA52222-CRID2	1		
07:29	ZZZZZZ	1		
07:34	MA52222-CCV1	1		
07:38	MA52222-CCB2	1		
07:43	MP32248-MB1	1		
07:48	MP32248-B1	1		
07:53	MP32248-S1	1		Ca, FE high
07:58	MP32248-S2	1		Ca, FE high
08:03	JD42748-1	1		(sample used for QC only; not part of login JD42497)
08:08	MP32248-SD1	5		Ca, FE high
08:13	MP32248-PS1	1		
08:17	JD42497-25	1		
08:22	MA52222-CCV2	1		
08:29	MA52222-CCB3	1		
08:34	ZZZZZZ	1		
08:39	ZZZZZZ	1		
08:44	ZZZZZZ	1		
08:49	ZZZZZZ	1		
08:54	MP32253-B1	1		
-----> Last reportable sample/prep for job JD42497				

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52222  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
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08:58 ZZZZZZ 2

09:03 ZZZZZZ 1

09:09 MA52222-CCV3 1

09:14 MA52222-CCB4 1

09:21 MA52222-CRI2 1

09:27 MA52222-ICSA2 1

09:32 MA52222-ICSAB2 1

09:38 MA52222-CCV4 1

09:42 MA52222-CCB5 1

-----> Last reportable CCB for job JD42497  
Refer to raw data for calibration curve and standards.

## REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52222

Time	Sample Description	Element: Dilution	A s	F e
06:11	MA52222-ICV1	1	X	X
06:16	MA52222-ICB1	1	X	X
06:23	MA52222-ICCV1	1	X	X
06:36	MA52222-CCB1	1	X	X
06:42	MA52222-CRID1	1		
06:48	MA52222-CRI1	1	X	X
06:52	MA52222-ICSA1	1	X	X
06:58	MA52222-ICSAB1	1	X	X
07:03	MA52222-HSTD1	1	X	X
07:08	MA52222-HSTD2	1	X	X
07:14	ZZZZZZ	1		
07:19	ZZZZZZ	1		
07:24	MA52222-CRID2	1	X	X
07:29	ZZZZZZ	1		
07:34	MA52222-CCV1	1	X	X
07:38	MA52222-CCB2	1	X	X
07:43	MP32248-MB1	1	X	X
07:48	MP32248-B1	1	X	X
07:53	MP32248-S1	1	X	
07:58	MP32248-S2	1	X	
08:03	JD42748-1	1		(a)
08:08	MP32248-SD1	5	X	X
08:13	MP32248-PS1	1		
08:17	JD42497-25	1	X	X
08:22	MA52222-CCV2	1	X	X
08:29	MA52222-CCB3	1	X	X
08:34	ZZZZZZ	1		
08:39	ZZZZZZ	1		
08:44	ZZZZZZ	1		
08:49	ZZZZZZ	1		
08:54	MP32253-B1	1	X	X
08:58	ZZZZZZ	2		
09:03	ZZZZZZ	1		
		Element:	A s	F e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52222  
 Parameters: As,Fe

Time	Sample Description	Dilution	Element: A F s e
09:09	MA52222-CCV3	1	X X
09:14	MA52222-CCB4	1	X X
09:21	MA52222-CRI2	1	X X
09:27	MA52222-ICSA2	1	X X
09:32	MA52222-ICSAB2	1	X X
09:38	MA52222-CCV4	1	X X
09:42	MA52222-CCB5	1	X X

(a) Sample used for QC only; not part of login JD42497.

Element: A F s e

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52222

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:01	MA52222-STD1	6491 R	202350 R	20972 R	11389 R
06:06	MA52222-STD2	6122	187720	20802	10066
06:11	MA52222-ICV1	6277	193110	21144	10395
06:16	MA52222-ICB1	6470	202410	21128	11326
06:23	MA52222-ICCV1	6340	193160	21117	10512
06:36	MA52222-CCB1	6517	201890	21390	11456
06:42	MA52222-CRID1	No results reported for the elements associated with this internal standard.			
06:48	MA52222-CRI1	6478	202790	21333	11297
06:52	MA52222-ICSA1	5938	178350	21186	9456
06:58	MA52222-ICSAB1	5952	179630	21226	9498
07:03	MA52222-HSTD1	6440	200690	21665	11288
07:08	MA52222-HSTD2	6049	184640	21371	9551
07:14	ZZZZZZ	6423	197690	21257	11440
07:19	ZZZZZZ	6398	201110	21165	11504
07:24	MA52222-CRID2	6640	207050	21686	11627
07:29	ZZZZZZ	6512	203450	21334	11549
07:34	MA52222-CCV1	6532	201570	22167	10806
07:38	MA52222-CCB2	6736	211370	21848	11789
07:43	MP32248-MB1	6802	212310	22420	11901
07:48	MP32248-B1	6643	208130	22699	11157
07:53	MP32248-S1	6881	210480	23917	10727
07:58	MP32248-S2	6770	210110	23625	10715
08:03	JD42748-1	6629	204370	23501	10364
08:08	MP32248-SD1	6780	211240	22758	11263
08:13	MP32248-PS1	6559	203140	23223	10223
08:17	JD42497-25	6884	211820	23562	11245
08:22	MA52222-CCV2	6739	207080	22764	11090
08:29	MA52222-CCB3	6929	217110	22345	12070
08:34	ZZZZZZ	6823	216040	22725	11916
08:39	ZZZZZZ	6805	217510	23014	11916
08:44	ZZZZZZ	6905	207950	23645	11200
08:49	ZZZZZZ	6879	211670	23532	11317
08:54	MP32253-B1	6915	213630	23005	11479

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52222

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:58	ZZZZZZ	6980	215350	23288	11612
09:03	ZZZZZZ	6855	209060	22920	11807
09:09	MA52222-CCV3	6830	208750	22909	11125
09:14	MA52222-CCB4	7059	220170	22764	12199
09:21	MA52222-CRI2	6992	217380	22957	12038
09:27	MA52222-ICSA2	6380	195050	22705	10055
09:32	MA52222-ICSAB2	6390	195140	22795	10092
09:38	MA52222-CCV4	6849	212330	23213	11310
09:42	MA52222-CCB5	7068	221910	23032	12341

R = Reference for ISTD limits.    ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52222 Units: ug/l

Time: Sample ID:			06:16 ICB1		06:36 CCB1		07:38 CCB2		08:29 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.00	<3.0	0.400	<3.0	-1.30	<3.0	-0.600	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	10.3	<100	11.7	<100	1.90	<100	0.300	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52222 Units: ug/l

Time: Sample ID:			06:16 ICB1		06:36 CCB1		07:38 CCB2		08:29 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52222 Units: ug/l

Time: Sample ID:			09:14 CCB4		09:42 CCB5	
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	17	anr			
Antimony	6.0	1.7	anr			
Arsenic	3.0	2.1	0.100	<3.0	-0.500	<3.0
Barium	200	.8	anr			
Beryllium	1.0	.3	anr			
Bismuth	20	2.3				
Boron	100	2.3				
Cadmium	3.0	.3	anr			
Calcium	5000	6.6	anr			
Cerium	100					
Chromium	10	.3	anr			
Cobalt	50	.4	anr			
Copper	10	.8	anr			
Iron	100	5.3	4.10	<100	3.70	<100
Lead	3.0	1.1	anr			
Lithium	50	4.8				
Magnesium	5000	32	anr			
Manganese	15	.1	anr			
Molybdenum	20	.6				
Nickel	10	.4	anr			
Phosphorus	50	1.2				
Potassium	10000	77	anr			
Selenium	10	3.2	anr			
Silicon	200	1.7				
Silver	10	1	anr			
Sodium	10000	34	anr			
Strontium	10	.3				
Sulfur	50	3	anr			
Thallium	10	1.8	anr			
Tin	10	.8				
Titanium	10	.5				
Tungsten	50	2.6				
Vanadium	50	.6	anr			

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52222 Units: ug/l

Time: Sample ID:			09:14 CCB4		09:42 CCB5	
Metal	RL	IDL	raw	final	raw	final

Zinc 20 .1 anr

Zirconium 10 .3

(\*) Outside of QC limits

(anr) Analyte not requested

6.4.3

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52222 Units: ug/l

Time:		06:23	
Sample ID:		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1970	98.5
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40200	100.5
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.4.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52222      Units: ug/l

Time:		06:23
Sample ID:		ICCV
Metal		True
		Results % Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.4.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52222      Units: ug/l

Time: Sample ID:		06:11 ICV1	% Rec	CCV	07:34 CCV1	% Rec	CCV	08:22 CCV2	% Rec
Metal	True	Results		True	Results		True	Results	
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2020	101.0	2000	1910	95.5	2000	1850	92.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	42500	106.3*(a	40000	38200	95.5	40000	37200	93.0
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur	anr								
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52222      Units: ug/l

Time:		06:11		07:34		08:22			
Sample ID:	ICV	ICV1		CCV	CCV1		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Within 90 to 110 percent limits required for SW846 6010. No EPA 200.7 samples reported for this element in the area bracketed by this QC.

6.4.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52222      Units: ug/l

Time: Sample ID:		09:09 CCV3		09:38 CCV4		
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	2000	1850	92.5	2000	1820	91.0
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	40000	39000	97.5	40000	36300	90.8
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur	anr					
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52222      Units: ug/l

Time:		09:09			09:38		
Sample ID:	CCV	CCV3		CCV	CCV4		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.4.5  
6



# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52222 Units: ug/l

Time:		07:03			07:08		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	8000	7630	95.4				
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron				200000	196000	98.0	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver							
Sodium							
Strontium							
Sulfur	anr						
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52222 Units: ug/l

Time:		07:03		07:08	
Sample ID:		HSTD1		HSTD2	
Metal	True	Results	% Rec	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.4.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52222 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	06:48 CRI1		07:24 CRID2		09:21 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	7.80	97.5	2.40	80.0	6.40	80.0
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		111	111.0			98.1	98.1
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50			anr					
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52222 Units: ug/l

Time:					06:48		07:24		09:21	
Sample ID:	CRI	CRIA	CRID	CRI1			CRID2		CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.4.7

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52222      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	06:52 ICSAB1 Results	% Rec	06:58 ICSAB1 Results	% Rec	09:27 ICSAB2 Results	% Rec	09:32 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	505000	101.0	504000	100.8	466000	93.2	467000	93.4
Antimony		1000	-1.60		960	96.0	-2.60		892	89.2
Arsenic		1000	0.500		960	96.0	0.500		889	88.9
Barium		500	6.10		462	92.4	5.40		430	86.0
Beryllium		500	0.100		453	90.6	0.00		419	83.8
Bismuth		500	-9.40		458	91.6	-6.90		424	84.8
Boron		500	-0.500		452	90.4	0.500		419	83.8
Cadmium		1000	0.600		963	96.3	0.400		889	88.9
Calcium	400000	400000	378000	94.5	393000	98.3	353000	88.3	358000	89.5
Cerium			13.4		471*		14.6		430*	
Chromium		500	-1.70		445	89.0	-1.10		406	81.2
Cobalt		500	0.700		455	91.0	0.700		426	85.2
Copper		500	2.90		487	97.4	3.40		440	88.0
Iron	200000	200000	191000	95.5	201000	100.5	177000	88.5	186000	93.0
Lead		1000	0.200		882	88.2	-1.80		823	82.3
Lithium		500	-7.60		525	105.0	-7.10		485	97.0
Magnesium	500000	500000	498000	99.6	488000	97.6	458000	91.6	449000	89.8
Manganese		500	0.800		479	95.8	0.800		436	87.2
Molybdenum		500	-2.00		455	91.0	-1.80		421	84.2
Nickel		1000	0.300		877	87.7	0.200		822	82.2
Phosphorus		500	-9.60		444	88.8	-9.50		416	83.2
Potassium			-601		-616		-578		-568	
Selenium		1000	2.60		877	87.7	3.30		810	81.0
Silicon		500	6.60		504	100.8	6.10		470	94.0
Silver		1000	4.90		1030	103.0	4.40		932	93.2
Sodium			65.2		80.3		59.4		71.4	
Strontium		500	-1.20		457	91.4	-1.30		424	84.8
Sulfur		500	-24.9		428	85.6	-15.4		405	81.0
Thallium		1000	-6.20		868	86.8	-4.40		809	80.9
Tin		500	-4.70		440	88.0	-4.80		408	81.6
Titanium		500	-2.10		463	92.6	-1.70		423	84.6
Tungsten		500	-0.300		468	93.6	0.00		435	87.0
Vanadium		500	-3.90		460	92.0	-2.60		420	84.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52222 Units: ug/l

Time:				06:52			06:58			09:27			09:32		
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	2.50			879	87.9	2.40		811	81.1				
Zirconium		500	1.60			426	85.2	1.30		389	77.8*				

(\*) Outside of QC limits  
(anr) Analyte not requested

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52223  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:27	MA52223-STD1	1		STDA
10:33	MA52223-STD2	1		STDB
10:37	MA52223-ICV1	1		
10:45	MA52223-ICB1	1		
10:53	MA52223-ICCV1	1		
11:00	MA52223-CCB1	1		
11:05	MA52223-CRID1	1		
11:10	MA52223-CRI1	1		
11:15	MA52223-ICSA1	1		
11:20	MA52223-ICSAB1	1		
11:25	MA52223-HSTD1	1		
11:30	MA52223-HSTD2	1		
11:35	MP32253-B1	1		
11:40	MP32253-MB1	1		
11:45	MP32253-S1	1		Ca, MN, Na high
11:50	MA52223-CCV1	1		
11:55	MA52223-CCB2	1		
12:00	MP32253-S2	1		Ca, MN, Na high
12:05	JD42841-1	1		(sample used for QC only; not part of login JD42497)
12:11	MP32253-SD1	5		Ca, MN, Na high
12:16	ZZZZZZ	1		
12:21	JD42497-28	1		
----->	Last reportable sample/prep for job JD42497			
12:26	ZZZZZZ	1		
12:31	MA52223-CRI2	1		
12:37	ZZZZZZ	1		
12:42	ZZZZZZ	2		
12:47	MA52223-CCV2	1		
12:51	MA52223-CCB3	1		
12:57	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:07	MA52223-CRID2	1		
13:12	MA52223-ICSA2	1		
13:17	MA52223-ICSAB2	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52223  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:22	MP32249-S1	2		
13:27	MP32249-S2	2		
13:32	DA43674-3	2		(sample used for QC only; not part of login JD42497)
13:36	MP32249-SD1	10		
13:42	MA52223-CCV3	1		
13:46	MA52223-CCB4	1		
----->	Last reportable CCB for job JD42497			
13:52	MP32284-B1	1		
13:56	MP32284-MB1	1		
14:01	MP32284-S1	1		
14:06	MP32284-S2	1		
14:11	JD42918-1	1		(sample used for QC only; not part of login JD42497)
14:16	MP32284-SD1	5		
14:22	ZZZZZZ	1		
14:27	ZZZZZZ	1		
14:32	MA52223-CCV4	1		
14:37	MA52223-CCB5	1		
14:42	ZZZZZZ	1		
14:47	ZZZZZZ	1		
14:52	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52223-CCV5	1		
15:13	MA52223-CCB6	1		
15:18	ZZZZZZ	1		
15:22	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Element: Dilution	A F s e
10:37	MA52223-ICV1	1	X X
10:45	MA52223-ICB1	1	X X
10:53	MA52223-ICCV1	1	X X
11:00	MA52223-CCB1	1	X X
11:05	MA52223-CRID1	1	X X
11:10	MA52223-CRI1	1	X X
11:15	MA52223-ICSA1	1	X X
11:20	MA52223-ICSAB1	1	X X
11:25	MA52223-HSTD1	1	X X
11:30	MA52223-HSTD2	1	X X
11:35	MP32253-B1	1	X
11:40	MP32253-MB1	1	X X
11:45	MP32253-S1	1	X
11:50	MA52223-CCV1	1	X X
11:55	MA52223-CCB2	1	X X
12:00	MP32253-S2	1	X
12:05	JD42841-1	1	(a)
12:11	MP32253-SD1	5	X
12:16	ZZZZZZ	1	
12:21	JD42497-28	1	X X
12:26	ZZZZZZ	1	
12:31	MA52223-CRI2	1	X X
12:37	ZZZZZZ	1	
12:42	ZZZZZZ	2	
12:47	MA52223-CCV2	1	X X
12:51	MA52223-CCB3	1	X X
12:57	ZZZZZZ	1	
13:02	ZZZZZZ	1	
13:07	MA52223-CRID2	1	X X
13:12	MA52223-ICSA2	1	X X
13:17	MA52223-ICSAB2	1	X X
13:22	MP32249-S1	2	
13:27	MP32249-S2	2	
		Element: Dilution	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Element: Dilution	A F s e
13:32	DA43674-3	2	(a)
13:36	MP32249-SD1	10	
13:42	MA52223-CCV3	1	X X
13:46	MA52223-CCB4	1	X X
13:52	MP32284-B1	1	
13:56	MP32284-MB1	1	
14:01	MP32284-S1	1	
14:06	MP32284-S2	1	
14:11	JD42918-1	1	(a)
14:16	MP32284-SD1	5	
14:22	ZZZZZZ	1	
14:27	ZZZZZZ	1	
14:32	MA52223-CCV4	1	X X
14:37	MA52223-CCB5	1	X X
14:42	ZZZZZZ	1	
14:47	ZZZZZZ	1	
14:52	ZZZZZZ	1	
14:58	ZZZZZZ	1	
15:03	ZZZZZZ	1	
15:08	MA52223-CCV5	1	X X
15:13	MA52223-CCB6	1	X X
15:18	ZZZZZZ	1	
15:22	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD42497.

Element: A F s e

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:27	MA52223-STD1	2369 R	67137 R	8780 R	6285 R
10:33	MA52223-STD2	2245	62614	8598	5582
10:37	MA52223-ICV1	2302	63909	8687	5756
10:45	MA52223-ICB1	2372	66513	8778	6261
10:53	MA52223-ICCV1	2301	63353	8746	5728
11:00	MA52223-CCB1	2376	66450	8867	6252
11:05	MA52223-CRID1	2377	66359	8908	6219
11:10	MA52223-CRI1	2362	65555	8857	6130
11:15	MA52223-ICSA1	2129	57681	8541	5108
11:20	MA52223-ICSAB1	2120	57149	8466	5097
11:25	MA52223-HSTD1	2334	65581	8819	6096
11:30	MA52223-HSTD2	2145	58715	8510	5120
11:35	MP32253-B1	2310	63943	8861	5803
11:40	MP32253-MB1	2353	66072	8876	6174
11:45	MP32253-S1	2169	59491	8605	5197
11:50	MA52223-CCV1	2299	62263	8729	5681
11:55	MA52223-CCB2	2367	65430	8797	6181
12:00	MP32253-S2	2174	59570	8730	5202
12:05	JD42841-1	2157	59744	8685	5296
12:11	MP32253-SD1	2289	63269	8809	5819
12:16	ZZZZZZ	2305	63411	8850	5766
12:21	JD42497-28	2355	65608	8940	6162
12:26	ZZZZZZ	2364	65558	8861	6167
12:31	MA52223-CRI2	2334	64660	8837	6049
12:37	ZZZZZZ	2400	64909	9381	5803
12:42	ZZZZZZ	2349	64174	8985	5880
12:47	MA52223-CCV2	2291	62229	8777	5657
12:51	MA52223-CCB3	2359	65429	8850	6162
12:57	ZZZZZZ	2358	65986	8982	6173
13:02	ZZZZZZ	2358	65163	8869	6145
13:07	MA52223-CRID2	2349	65154	8858	6123
13:12	MA52223-ICSA2	2109	56308	8459	5033
13:17	MA52223-ICSAB2	2123	56127	8583	5043

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52223

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:22	MP32249-S1	2340	63187	9141	5677
13:27	MP32249-S2	2331	63207	9108	5692
13:32	DA43674-3	2325	63847	9186	5705
13:36	MP32249-SD1	2355	64630	8907	6044
13:42	MA52223-CCV3	2268	61752	8712	5603
13:46	MA52223-CCB4	2344	64950	8820	6117
13:52	MP32284-B1	2306	62920	8949	5777
13:56	MP32284-MB1	2344	65193	8963	6172
14:01	MP32284-S1	2163	59866	8783	5254
14:06	MP32284-S2	2157	59304	8729	5231
14:11	JD42918-1	2181	59416	8657	5334
14:16	MP32284-SD1	2285	62966	8893	5812
14:22	ZZZZZZ	2181	60144	8760	5374
14:27	ZZZZZZ	2193	60211	8765	5356
14:32	MA52223-CCV4	2272	62072	8830	5617
14:37	MA52223-CCB5	2338	63903	8783	6100
14:42	ZZZZZZ	2173	60320	8822	5362
14:47	ZZZZZZ	2168	60524	8922	5343
14:52	ZZZZZZ	2158	60245	8854	5313
14:58	ZZZZZZ	2156	59751	8819	5308
15:03	ZZZZZZ	2195	60303	8896	5337
15:08	MA52223-CCV5	2268	62116	8919	5605
15:13	MA52223-CCB6	2349	65197	8943	6135
15:18	ZZZZZZ	2310	63822	8949	6098
15:22	ZZZZZZ	2289	64665	8875	6093

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52223 Units: ug/l

Time: Sample ID:			10:45 ICB1		11:00 CCB1		11:55 CCB2		12:51 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	16								
Antimony	6.0	2.5								
Arsenic	3.0	2	0.00	<3.0	-0.900	<3.0	1.10	<3.0	1.60	<3.0
Barium	200	.4								
Beryllium	1.0	.1								
Bismuth	20	3.6								
Boron	100	1.9								
Cadmium	3.0	.4								
Calcium	5000	5.6								
Cerium	100									
Chromium	10	.5								
Cobalt	50	.5								
Copper	10	1	anr							
Iron	100	11	-4.10	<100	-4.70	<100	9.20	<100	34.9	<100
Lead	3.0	1.2	anr							
Lithium	50	2.3								
Magnesium	5000	65								
Manganese	15	.2								
Molybdenum	20	.4								
Nickel	10	.3	anr							
Phosphorus	50	4.1								
Potassium	10000	55								
Selenium	10	3.5								
Silicon	200	1.6								
Silver	10	1.1								
Sodium	10000	11	anr							
Strontium	10	.1								
Sulfur	50	4.4								
Thallium	10	2.5								
Tin	10	1								
Titanium	10	.4								
Tungsten	50	2.8								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52223 Units: ug/l

Time: Sample ID:			10:45 ICB1		11:00 CCB1		11:55 CCB2		12:51 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.4								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52223 Units: ug/l

Time: Sample ID:		13:46 CCB4			
Metal	RL	IDL	raw	final	
Aluminum	200	16			
Antimony	6.0	2.5			
Arsenic	3.0	2	-0.400	<3.0	
Barium	200	.4			
Beryllium	1.0	.1			
Bismuth	20	3.6			
Boron	100	1.9			
Cadmium	3.0	.4			
Calcium	5000	5.6			
Cerium	100				
Chromium	10	.5			
Cobalt	50	.5			
Copper	10	1	anr		
Iron	100	11	16.8	<100	
Lead	3.0	1.2	anr		
Lithium	50	2.3			
Magnesium	5000	65			
Manganese	15	.2			
Molybdenum	20	.4			
Nickel	10	.3	anr		
Phosphorus	50	4.1			
Potassium	10000	55			
Selenium	10	3.5			
Silicon	200	1.6			
Silver	10	1.1			
Sodium	10000	11	anr		
Strontium	10	.1			
Sulfur	50	4.4			
Thallium	10	2.5			
Tin	10	1			
Titanium	10	.4			
Tungsten	50	2.8			
Vanadium	50	.6			

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52223      Units: ug/l

Time:		13:46		
Sample ID:		CCB4		
Metal	RL	IDL	raw	final

Zinc      20      .1      anr

Zirconium      10      .4

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.3

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52223 Units: ug/l

Time:		10:53	
Sample ID:		ICCV	
Metal		True	
		Results	
		% Rec	
Aluminum			
Antimony			
Arsenic	2000	2010	100.5
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper	anr		
Iron	40000	40000	100.0
Lead	anr		
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium	anr		
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

6.5.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52223      Units: ug/l

Time:	10:53
Sample ID:	ICCV ICCV1
Metal	True Results % Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time:		10:37		11:50		12:47	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum							
Antimony							
Arsenic	2000	1970	98.5	2000	2030	101.5	2000
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	40000	41100	102.8	40000	40000	100.0	40000
Lead	anr						
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium	anr						
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time:		10:37			11:50			12:47		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time: Sample ID: CCV		13:42 CCV3		
Metal	True	Results	% Rec	
Aluminum				
Antimony				
Arsenic	2000	2030	101.5	
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	40000	39700	99.3	
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time:	13:42
Sample ID:	CCV
	CCV3
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.5

6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52223 Units: ug/l

Time:		11:25		11:30		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony						
Arsenic	8000	7430	92.9			
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron				200000	196000	98.0
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52223      Units: ug/l

Time:		11:25		11:30	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.6

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	11:05 CRID1		11:10 CRI1		12:31 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	3.30	110.0	7.80	97.5	8.70	108.8
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0						
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				108	108.0	106	106.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0						
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time:					11:05		11:10		12:31	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True							

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.5.7  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	13:07 CRID2	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100		
Antimony	6.0	20	3.0		
Arsenic	8.0	20	3.0	2.80	93.3
Barium	200		4.0		
Beryllium	2.0		1.0		
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0		
Calcium	5000	2000	1000		
Cerium					
Chromium	10		2.0		
Cobalt	50		3.0		
Copper	10		2.0		
Iron	100	500			
Lead	3.0	20	2.5		
Lithium	50				
Magnesium	5000	2000	100		
Manganese	15		3.0		
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000		
Selenium	10	20	5.0		
Silicon	200				
Silver	5.0		2.0		
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0		
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0		

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time:				13:07	
Sample ID:	CRI	CRIA	CRID	CRID2	
Metal	True	True	True	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.5.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52223      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	11:15 ICSAB1 Results	% Rec	11:20 ICSAB1 Results	% Rec	13:12 ICSAB2 Results	% Rec	13:17 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	511000	102.2	520000	104.0	510000	102.0	513000	102.6
Antimony		1000	5.80		1020	102.0	5.50		1040	104.0
Arsenic		1000	1.60		1010	101.0	-0.300		1030	103.0
Barium		500	-46.6		429	85.8	-46.2		424	84.8
Beryllium		500	-0.400		464	92.8	-0.500		450	90.0
Bismuth		500	4.20		489	97.8	2.30		494	98.8
Boron		500	-2.70		475	95.0	-3.90		479	95.8
Cadmium		1000	-0.500		1030	103.0	-0.900		1010	101.0
Calcium	400000	400000	384000	96.0	398000	99.5	379000	94.8	388000	97.0
Cerium			147*		660*		151*		669*	
Chromium		500	-3.00		470	94.0	-2.40		482	96.4
Cobalt		500	-1.10		471	94.2	-1.50		482	96.4
Copper		500	-3.50		512	102.4	-2.60		520	104.0
Iron	200000	200000	190000	95.0	201000	100.5	192000	96.0	200000	100.0
Lead		1000	2.40		939	93.9	1.80		957	95.7
Lithium		500	5.20		568	113.6	4.50		567	113.4
Magnesium	500000	500000	499000	99.8	496000	99.2	495000	99.0	484000	96.8
Manganese		500	1.30		505	101.0	1.00		512	102.4
Molybdenum		500	-3.40		464	92.8	-3.70		467	93.4
Nickel		1000	-2.00		917	91.7	-1.50		917	91.7
Phosphorus		500	4.00		498	99.6	15.3		508	101.6
Potassium			147		172		159		165	
Selenium		1000	7.10		906	90.6	3.80		925	92.5
Silicon		500	-2.70		533	106.6	-4.80		537	107.4
Silver		1000	2.10		1040	104.0	-1.90		1050	105.0
Sodium			-32.2		-17.2		-25.6		-10.4	
Strontium		500	0.600		467	93.4	0.500		461	92.2
Sulfur		500	-6.40		465	93.0	-12.0		468	93.6
Thallium		1000	2.90		822	82.2	-0.700		930	93.0
Tin		500	-2.10		458	91.6	-3.00		464	92.8
Titanium		500	-0.700		495	99.0	-1.20		500	100.0
Tungsten		500	3.90		493	98.6	8.40		497	99.4
Vanadium		500	-0.700		500	100.0	0.00		508	101.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52223 Units: ug/l

Time:				11:15			11:20			13:12			13:17
Sample ID:	ICSAB	ICSAB	ICSAB	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True										

Zinc	1000	4.90		917	91.7	4.70		920	92.0
Zirconium	500	-4.30		458	91.6	-3.60		466	93.2

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.8

6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52229  
Parameters: Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:35	MA52229-STD1	1		STDA
13:42	MA52229-STD2	1		STDB
13:47	MA52229-ICV1	1		
13:53	MA52229-ICV2	1		
14:00	MA52229-ICB1	1		
14:06	MA52229-ICCV1	1		
14:18	MA52229-CCB1	1		
14:22	MA52229-CRID1	1		
14:27	MA52229-CRI1	1		
14:32	MA52229-ICSA1	1		
14:37	MA52229-ICSAB1	1		
14:42	MA52229-HSTD1	1		
14:48	MA52229-HSTD2	1		
14:53	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52229-CCV1	1		
15:13	MA52229-CCB2	1		
15:18	ZZZZZZ	1		
15:23	ZZZZZZ	1		
15:28	MP32248-S1	2		
15:33	MP32248-S2	2		
15:38	JD42748-1	2		(sample used for QC only; not part of login JD42497)
15:42	MP32248-SD1	10		
----->	Last reportable sample/prep for job JD42497			
15:47	MA52229-CCV2	1		
15:52	MA52229-CCB3	1		
15:57	ZZZZZZ	1		
16:02	ZZZZZZ	1		
16:07	ZZZZZZ	1		
16:12	ZZZZZZ	1		
16:17	ZZZZZZ	1		
16:23	ZZZZZZ	1		
16:27	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52229  
Parameters: Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:32	ZZZZZZ	1		
16:38	ZZZZZZ	1		
16:43	MA52229-CCV3	1		
16:47	MA52229-CCB4	1		
16:53	MP32273-MB1	1		
16:58	MP32273-B1	1		
17:02	MP32273-S1	1		Ca, S high
17:07	MP32273-S2	1		Ca, S high
17:12	JD42855-1A	1		(sample used for QC only; not part of login JD42497)
17:18	MP32273-SD1	5		Ca, S high
17:23	ZZZZZZ	1		
17:28	ZZZZZZ	1		
17:33	ZZZZZZ	1		
17:38	ZZZZZZ	1		
17:43	MA52229-CCV4	1		
17:47	MA52229-CCB5	1		
17:52	MP32280-MB1	1		batch to reanalyze, spk blank out
17:57	MP32280-B1	1		
18:02	MP32280-S1	1		
18:07	MP32280-S2	1		
18:12	JD42834-2	1		(sample used for QC only; not part of login JD42497)
18:17	MP32280-SD1	5		
18:22	MP32280-PS1	1		
18:27	ZZZZZZ	1		
18:32	ZZZZZZ	1		
18:37	ZZZZZZ	1		
18:42	MA52229-CCV5	1		
18:46	MA52229-CCB6	1		
18:52	MA52229-CRI2	1		
18:56	MA52229-CRID2	1		
19:02	MA52229-ICSA2	1		
19:07	MA52229-ICSAB2	1		
19:12	MA52229-CCV6	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52229  
Parameters: Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
19:16	MA52229-CCB7	1		
----->	Last reportable CCB for job JD42497			
19:21	ZZZZZZ	1		
19:26	ZZZZZZ	1		
19:31	ZZZZZZ	1		
19:36	ZZZZZZ	1		
19:41	ZZZZZZ	1		
19:46	ZZZZZZ	1		
19:51	ZZZZZZ	1		
19:56	ZZZZZZ	1		
20:01	ZZZZZZ	1		
20:06	ZZZZZZ	1		
20:12	MA52229-CCV7	1		
20:16	MA52229-CCB8	1		
20:22	ZZZZZZ	1		
20:27	ZZZZZZ	1		
20:32	ZZZZZZ	1		
20:37	ZZZZZZ	1		
20:42	ZZZZZZ	1		
20:47	ZZZZZZ	1		
20:52	ZZZZZZ	1		
20:56	ZZZZZZ	1		
21:02	ZZZZZZ	1		
21:06	ZZZZZZ	1		
21:11	MA52229-CCV8	1		
21:16	MA52229-CCB9	1		
21:21	ZZZZZZ	1		
21:26	ZZZZZZ	1		
21:31	ZZZZZZ	1		
21:36	ZZZZZZ	1		
21:41	ZZZZZZ	1		
21:46	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

## REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Dilution	Element: Fe
13:47	MA52229-ICV1	1	
13:53	MA52229-ICV2	1	X
14:00	MA52229-ICB1	1	X
14:06	MA52229-ICCV1	1	X
14:18	MA52229-CCB1	1	X
14:22	MA52229-CRID1	1	X
14:27	MA52229-CRI1	1	X
14:32	MA52229-ICSA1	1	X
14:37	MA52229-ICSAB1	1	X
14:42	MA52229-HSTD1	1	X
14:48	MA52229-HSTD2	1	X
14:53	ZZZZZZ	1	
14:58	ZZZZZZ	1	
15:03	ZZZZZZ	1	
15:08	MA52229-CCV1	1	X
15:13	MA52229-CCB2	1	X
15:18	ZZZZZZ	1	
15:23	ZZZZZZ	1	
15:28	MP32248-S1	2	X
15:33	MP32248-S2	2	X
15:38	JD42748-1	2	(a)
15:42	MP32248-SD1	10	
15:47	MA52229-CCV2	1	X
15:52	MA52229-CCB3	1	X
15:57	ZZZZZZ	1	
16:02	ZZZZZZ	1	
16:07	ZZZZZZ	1	
16:12	ZZZZZZ	1	
16:17	ZZZZZZ	1	
16:23	ZZZZZZ	1	
16:27	ZZZZZZ	1	
16:32	ZZZZZZ	1	
16:38	ZZZZZZ	1	
			Element: Fe

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Element: Fe Dilution	e
16:43	MA52229-CCV3	1	X
16:47	MA52229-CCB4	1	X
16:53	MP32273-MB1	1	X
16:58	MP32273-B1	1	X
17:02	MP32273-S1	1	X
17:07	MP32273-S2	1	X
17:12	JD42855-1A	1	X (a)
17:18	MP32273-SD1	5	X
17:23	ZZZZZZ	1	
17:28	ZZZZZZ	1	
17:33	ZZZZZZ	1	
17:38	ZZZZZZ	1	
17:43	MA52229-CCV4	1	X
17:47	MA52229-CCB5	1	X
17:52	MP32280-MB1	1	batch to reanalyze, spk blank out
17:57	MP32280-B1	1	
18:02	MP32280-S1	1	
18:07	MP32280-S2	1	
18:12	JD42834-2	1	
18:17	MP32280-SD1	5	
18:22	MP32280-PS1	1	
18:27	ZZZZZZ	1	
18:32	ZZZZZZ	1	
18:37	ZZZZZZ	1	
18:42	MA52229-CCV5	1	X
18:46	MA52229-CCB6	1	X
18:52	MA52229-CRI2	1	X
18:56	MA52229-CRID2	1	X
19:02	MA52229-ICSA2	1	X
19:07	MA52229-ICSAB2	1	X
19:12	MA52229-CCV6	1	X
19:16	MA52229-CCB7	1	X
19:21	ZZZZZZ	1	
		Element: Fe	e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
 Analyst: ND  
 Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52229

Time	Sample Description	Element: Fe Dilution
19:26	ZZZZZZ	1
19:31	ZZZZZZ	1
19:36	ZZZZZZ	1
19:41	ZZZZZZ	1
19:46	ZZZZZZ	1
19:51	ZZZZZZ	1
19:56	ZZZZZZ	1
20:01	ZZZZZZ	1
20:06	ZZZZZZ	1
20:12	MA52229-CCV7	1 X
20:16	MA52229-CCB8	1 X
20:22	ZZZZZZ	1
20:27	ZZZZZZ	1
20:32	ZZZZZZ	1
20:37	ZZZZZZ	1
20:42	ZZZZZZ	1
20:47	ZZZZZZ	1
20:52	ZZZZZZ	1
20:56	ZZZZZZ	1
21:02	ZZZZZZ	1
21:06	ZZZZZZ	1
21:11	MA52229-CCV8	1 X
21:16	MA52229-CCB9	1 X
21:21	ZZZZZZ	1
21:26	ZZZZZZ	1
21:31	ZZZZZZ	1
21:36	ZZZZZZ	1
21:41	ZZZZZZ	1
21:46	ZZZZZZ	1

(a) Sample used for QC only; not part of login JD42497.

Element: Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:35	MA52229-STD1	6998 R	203320 R	19654 R	11938 R
13:42	MA52229-STD2	6791	191180	19602	10810
13:47	MA52229-ICV1	No results reported for the elements associated with this internal standard.			
13:53	MA52229-ICV2	7488	213240	21574	11823
14:00	MA52229-ICB1	7376	211290	19899	12411
14:06	MA52229-ICCV1	7183	201250	19735	11476
14:18	MA52229-CCB1	7480	213790	20178	12523
14:22	MA52229-CRID1	7407	213100	20101	12362
14:27	MA52229-CRI1	7390	213300	20320	12270
14:32	MA52229-ICSA1	6829	190030	20182	10432
14:37	MA52229-ICSAB1	6849	192080	20247	10463
14:42	MA52229-HSTD1	7454	213170	20495	12392
14:48	MA52229-HSTD2	6897	193600	20317	10458
14:53	ZZZZZZ	7215	203700	19592	12294
14:58	ZZZZZZ	7197	207690	19834	12347
15:03	ZZZZZZ	7328	202860	19883	12378
15:08	MA52229-CCV1	7430	206630	20771	11698
15:13	MA52229-CCB2	7571	217420	20712	12644
15:18	ZZZZZZ	25185 !	641950 !	48057 !	39035 !
15:23	ZZZZZZ	7629	202710	16558	12700
15:28	MP32248-S1	7322	196120	16993	11515
15:33	MP32248-S2	7635	215490	21456	12017
15:38	JD42748-1	7486	212630	21242	11671
15:42	MP32248-SD1	7531	214670	20920	12293
15:47	MA52229-CCV2	7363	209300	20620	11736
15:52	MA52229-CCB3	7607	218250	20393	12791
15:57	ZZZZZZ	7688	220620	20985	12920
16:02	ZZZZZZ	7243	206600	21339	11157
16:07	ZZZZZZ	7075	200330	21090	10655
16:12	ZZZZZZ	7422	213790	21400	11726
16:17	ZZZZZZ	7053	200170	21034	10708
16:23	ZZZZZZ	7766	219850	21690	12385
16:27	ZZZZZZ	7703	220470	21847	12227

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:32	ZZZZZZ	7787	221600	23646	10624
16:38	ZZZZZZ	7812	224290	21714	12768
16:43	MA52229-CCV3	7595	213130	21430	12023
16:47	MA52229-CCB4	7733	221760	21220	12949
16:53	MP32273-MB1	7231	196630	19462	12365
16:58	MP32273-B1	7166	201610	19798	11730
17:02	MP32273-S1	6197	179420	19030	9424
17:07	MP32273-S2	6196	179140	18865	9432
17:12	JD42855-1A	6295	181040	19065	9562
17:18	MP32273-SD1	6995	200540	20143	11029
17:23	ZZZZZZ	7299	208900	20104	12292
17:28	ZZZZZZ	7028	201700	19854	11511
17:33	ZZZZZZ	6976	199760	19482	11496
17:38	ZZZZZZ	7039	200960	19628	11594
17:43	MA52229-CCV4	7323	206490	20465	11644
17:47	MA52229-CCB5	7583	216580	20516	12699
17:52	MP32280-MB1	No results reported for the elements associated with this internal standard.			
17:57	MP32280-B1	No results reported for the elements associated with this internal standard.			
18:02	MP32280-S1	No results reported for the elements associated with this internal standard.			
18:07	MP32280-S2	No results reported for the elements associated with this internal standard.			
18:12	JD42834-2	No results reported for the elements associated with this internal standard.			
18:17	MP32280-SD1	No results reported for the elements associated with this internal standard.			
18:22	MP32280-PS1	No results reported for the elements associated with this internal standard.			
18:27	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:32	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:37	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:42	MA52229-CCV5	7420	208250	20354	11736
18:46	MA52229-CCB6	7640	216200	20232	12736
18:52	MA52229-CRI2	7556	217180	20486	12497
18:56	MA52229-CRID2	7618	216540	20480	12700
19:02	MA52229-ICSA2	6832	191210	19977	10414
19:07	MA52229-ICSAB2	6932	193210	20068	10534
19:12	MA52229-CCV6	7563	212790	20744	11975

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
 Analyst: ND  
 Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52229

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
19:16	MA52229-CCB7	7704	219780	20833	12870
19:21	ZZZZZZ	7511	211200	20466	12395
19:26	ZZZZZZ	7467	211930	20770	12196
19:31	ZZZZZZ	5940	169930	19387	8770
19:36	ZZZZZZ	7220	205640	20237	11776
19:41	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:46	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:51	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:56	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:01	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:12	MA52229-CCV7	7591	215040	21311	12070
20:16	MA52229-CCB8	7742	222680	21320	13004
20:22	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:27	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:32	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:37	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:42	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:47	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:52	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:56	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:02	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:11	MA52229-CCV8	7626	213710	21322	12111
21:16	MA52229-CCB9	7840	223750	20978	13141
21:21	ZZZZZZ	7830	223960	21453	13091
21:26	ZZZZZZ	7786	223980	21202	13021
21:31	ZZZZZZ	7852	223800	21276	13197
21:36	ZZZZZZ	7573	215890	20504	12885
21:41	ZZZZZZ	7382	206160	20453	11980
21:46	ZZZZZZ	7364	208530	20439	11971

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %

# INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
 Analyst: ND      Run ID: MA52229  
 Parameters: Fe

Sample					
Time	Description	Istd#1	Istd#2	Istd#3	Istd#4
Istd#4	Yttrium (3600)		70-130 %		
Istd#3	Yttrium (3710)		70-130 %		
Istd#4	Indium		70-130 %		

6.6.2

6



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52229 Units: ug/l

Time: Sample ID:			14:00 ICB1		14:18 CCB1		15:13 CCB2		15:52 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	anr							
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	3.80	<100	1.30	<100	1.90	<100	4.30	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7	anr							
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52229 Units: ug/l

Time: Sample ID:			14:00 ICB1		14:18 CCB1		15:13 CCB2		15:52 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52229 Units: ug/l

Time: Sample ID:			16:47 CCB4		17:47 CCB5		18:46 CCB6		19:16 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	anr							
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	-1.60	<100	-0.500	<100	0.500	<100	3.00	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7	anr							
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52229 Units: ug/l

Time: Sample ID:			16:47 CCB4	17:47 CCB5	18:46 CCB6	19:16 CCB7		
Metal	RL	IDL	raw	final	raw	final	raw	final
Zinc	20	.1	anr					
Zirconium	10	.3						
(*) Outside of QC limits								
(anr) Analyte not requested								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52229      Units: ug/l

Time:		14:06	
Sample ID:		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	anr		
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40200	100.5
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52229      Units: ug/l

Time:		14:06
Sample ID:	ICCV	ICCV1
Metal	True	Results % Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time: Sample ID:		13:53 ICV2	% Rec	CCV	15:08 CCV1	% Rec	CCV	15:47 CCV2	% Rec
Metal	True	Results		True	Results		True	Results	
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	40800	102.0	40000	41800	104.5	40000	41900	104.8
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon	anr								
Silver	anr								
Sodium	anr								
Strontium									
Sulfur	anr								
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time:		13:53			15:08			15:47		
Sample ID:	ICV	ICV2		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.5  
6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time: Sample ID:		16:43 CCV3	% Rec	CCV	17:43 CCV4	% Rec	CCV	18:42 CCV5	% Rec
Metal	True	Results		True	Results		True	Results	
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	40900	102.3	40000	40200	100.5	40000	39700	99.3
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon	anr								
Silver	anr								
Sodium	anr								
Strontium									
Sulfur	anr								
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time:		16:43			17:43			18:42		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time: Sample ID: CCV		19:12 CCV6		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	40000	37600	94.0	
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon	anr			
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time:	19:12
Sample ID:	CCV
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.5

6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52229 Units: ug/l

Time:		14:42			14:48		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron				200000	199000	99.5	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon	anr						
Silver	anr						
Sodium							
Strontium							
Sulfur	anr						
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52229 Units: ug/l

Time:		14:42			14:48		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.6.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:22 CRID1	14:27 CRI1	18:52 CRI2
Metal	True	True	True	Results % Rec	Results % Rec	Results % Rec
Aluminum	200	500	100	anr		
Antimony	6.0	20	3.0			
Arsenic	8.0	20	3.0	anr		
Barium	200		4.0	anr		
Beryllium	2.0		1.0	anr		
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0	anr		
Calcium	5000	2000	1000	anr		
Cerium						
Chromium	10		2.0	anr		
Cobalt	50		3.0	anr		
Copper	10		2.0			
Iron	100	500			105 105.0	98.5 98.5
Lead	3.0	20	2.5			
Lithium	50					
Magnesium	5000	2000	100	anr		
Manganese	15		3.0	anr		
Molybdenum	20					
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000	anr		
Selenium	10	20	5.0	anr		
Silicon	200					
Silver	5.0		2.0			
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0			
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0	anr		

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time:					14:22		14:27		18:52	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.6.7

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	18:56 CRID2	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100	anr	
Antimony	6.0	20	3.0		
Arsenic	8.0	20	3.0	anr	
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0		
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	
Cobalt	50		3.0	anr	
Copper	10		2.0		
Iron	100	500			
Lead	3.0	20	2.5		
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0		
Silicon	200				
Silver	5.0		2.0		
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0		
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	anr	

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time:				18:56	
Sample ID:	CRI	CRIA	CRID	CRID2	
Metal	True	True	True	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.6.7

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52229      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	14:32 ICSAB1 Results	% Rec	14:37 ICSAB1 Results	% Rec	19:02 ICSAB2 Results	% Rec	19:07 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	501000	100.2	506000	101.2	484000	96.8	490000	98.0
Antimony		1000	-1.80		949	94.9	0.400		916	91.6
Arsenic		1000	1.00		945	94.5	0.00		891	89.1
Barium		500	6.20		455	91.0	5.90		430	86.0
Beryllium		500	0.100		447	89.4	0.100		428	85.6
Bismuth		500	-13.2		437	87.4	-15.8		415	83.0
Boron		500	1.80		451	90.2	0.400		433	86.6
Cadmium		1000	0.200		942	94.2	0.200		905	90.5
Calcium	400000	400000	377000	94.3	393000	98.3	365000	91.3	374000	93.5
Cerium			24.5		471*		25.4		456*	
Chromium		500	-1.00		441	88.2	-1.40		422	84.4
Cobalt		500	0.900		458	91.6	0.700		435	87.0
Copper		500	4.40		481	96.2	4.30		495	99.0
Iron	200000	200000	193000	96.5	203000	101.5	184000	92.0	195000	97.5
Lead		1000	0.00		891	89.1	1.40		856	85.6
Lithium		500	-5.90		519	103.8	-5.70		492	98.4
Magnesium	500000	500000	497000	99.4	487000	97.4	470000	94.0	464000	92.8
Manganese		500	0.400		472	94.4	0.100		449	89.8
Molybdenum		500	-2.50		449	89.8	-1.00		425	85.0
Nickel		1000	-0.800		885	88.5	-0.900		847	84.7
Phosphorus		500	-2.30		432	86.4	-0.100		415	83.0
Potassium			-689		-719		-665		-613	
Selenium		1000	0.400		853	85.3	-6.00		807	80.7
Silicon		500	5.80		498	99.6	5.80		479	95.8
Silver		1000	4.20		983	98.3	3.80		952	95.2
Sodium			114		98.9		130		140	
Strontium		500	-1.40		450	90.0	-1.40		428	85.6
Sulfur		500	-19.8		432	86.4	-10.6		427	85.4
Thallium		1000	-2.10		878	87.8	-2.20		848	84.8
Tin		500	-5.40		441	88.2	-4.90		416	83.2
Titanium		500	-1.70		459	91.8	-1.80		442	88.4
Tungsten		500	-1.30		465	93.0	3.20		440	88.0
Vanadium		500	1.70		458	91.6	2.90		438	87.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52229 Units: ug/l

Time:				14:32			14:37			19:02			19:07	
Sample ID:	ICSA	ICSAB	ICSA1				ICSAB1			ICSA2			ICSAB2	
Metal	True	True	Results	% Rec			Results	% Rec		Results	% Rec		Results	% Rec

Zinc		1000	2.60		886	88.6	2.10		832	83.2
Zirconium		500	-0.800		410	82.0	-1.60		391	78.2*

(\*) Outside of QC limits  
(anr) Analyte not requested

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:28	MA52233-STD1	1		STDA
08:33	MA52233-STD2	1		STDB
08:38	MA52233-ICV1	1		
08:44	MA52233-ICB1	1		
08:49	MA52233-CCV1	1		
08:54	MA52233-CCB1	1		
08:59	MA52233-CRID1	1		
09:05	MA52233-CRI1	1		
09:10	MA52233-ICSA1	1		
09:15	MA52233-ICSAB1	1		
09:20	ZZZZZZ	1		
09:25	ZZZZZZ	1		
09:30	MA52233-HSTD1	1		
09:36	MA52233-HSTD2	1		
09:41	MP32280-B1	1		
09:46	ZZZZZZ	1		
09:51	MA52233-CCV2	1		
09:56	MA52233-CCB2	1		
10:01	ZZZZZZ	1		
10:06	ZZZZZZ	1		
10:11	MP32280-MB1	1		
10:16	MP32280-S1	1		
10:21	MP32280-S2	1		
10:26	JD42834-2	1		(sample used for QC only; not part of login JD42497)
10:31	MP32280-SD1	5		
10:36	MP32280-PS1	1		
10:41	MA52233-CCV3	1		
10:46	MA52233-CCB3	1		
10:51	ZZZZZZ	1		
10:56	ZZZZZZ	1		
11:01	ZZZZZZ	1		
11:06	ZZZZZZ	1		
11:11	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:16	MA52233-CCV4	1		
11:21	MA52233-CCB4	1		
11:26	MA52233-CRID2	1		
11:31	MP32253-S1	5		
11:36	MP32253-S2	5		
11:41	JD42841-1	5		(sample used for QC only; not part of login JD42497)
11:46	MP32253-SD1	25		
----->	Last reportable sample/prep for job JD42497			
11:51	ZZZZZZ	5		
11:56	ZZZZZZ	5		
12:01	ZZZZZZ	5		
12:06	ZZZZZZ	5		
12:11	MA52233-CCV5	1		
12:16	MA52233-CCB5	1		
12:21	ZZZZZZ	1		
12:26	MA52233-CRI2	1		
12:32	ZZZZZZ	2		
12:37	ZZZZZZ	1		
12:42	ZZZZZZ	5		
12:47	ZZZZZZ	5		
12:52	ZZZZZZ	5		
12:57	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:07	MA52233-CCV6	1		
13:12	MA52233-CCB6	1		
13:17	MA52233-ICSA2	1		
13:22	MA52233-ICSAB2	1		
13:27	ZZZZZZ	5		
13:33	ZZZZZZ	25		
13:38	ZZZZZZ	1		
13:43	MA52233-CCV7	1		
----->	Last reportable CCB for job JD42497			
13:48	MA52233-CCB7	1		
13:53	ZZZZZZ	1		
13:58	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52233  
Parameters: As

Time	Sample	Dilution PS		Comments
	Description	Factor	Recov	
14:03	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

6.7

6

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Element: A Dilution s
08:38	MA52233-ICV1	1 X
08:44	MA52233-ICB1	1 X
08:49	MA52233-CCV1	1 X
08:54	MA52233-CCB1	1 X
08:59	MA52233-CRID1	1 X
09:05	MA52233-CRI1	1 X
09:10	MA52233-ICSA1	1 X
09:15	MA52233-ICSAB1	1 X
09:20	ZZZZZZ	1
09:25	ZZZZZZ	1
09:30	MA52233-HSTD1	1 X
09:36	MA52233-HSTD2	1 X
09:41	MP32280-B1	1
09:46	ZZZZZZ	1
09:51	MA52233-CCV2	1 X
09:56	MA52233-CCB2	1 X
10:01	ZZZZZZ	1
10:06	ZZZZZZ	1
10:11	MP32280-MB1	1 X
10:16	MP32280-S1	1
10:21	MP32280-S2	1
10:26	JD42834-2	1 (a)
10:31	MP32280-SD1	5
10:36	MP32280-PS1	1
10:41	MA52233-CCV3	1 X
10:46	MA52233-CCB3	1 X
10:51	ZZZZZZ	1
10:56	ZZZZZZ	1
11:01	ZZZZZZ	1
11:06	ZZZZZZ	1
11:11	ZZZZZZ	1
11:16	MA52233-CCV4	1 X
11:21	MA52233-CCB4	1 X
		Element: A s



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Element: A Dilution s
11:26	MA52233-CRID2	1 X
11:31	MP32253-S1	5 X
11:36	MP32253-S2	5 X
11:41	JD42841-1	5 (a)
11:46	MP32253-SD1	25 X
11:51	ZZZZZZ	5
11:56	ZZZZZZ	5
12:01	ZZZZZZ	5
12:06	ZZZZZZ	5
12:11	MA52233-CCV5	1 X
12:16	MA52233-CCB5	1 X
12:21	ZZZZZZ	1
12:26	MA52233-CRI2	1 X
12:32	ZZZZZZ	2
12:37	ZZZZZZ	1
12:42	ZZZZZZ	5
12:47	ZZZZZZ	5
12:52	ZZZZZZ	5
12:57	ZZZZZZ	1
13:02	ZZZZZZ	1
13:07	MA52233-CCV6	1 X
13:12	MA52233-CCB6	1 X
13:17	MA52233-ICSA2	1 X
13:22	MA52233-ICSAB2	1 X
13:27	ZZZZZZ	5
13:33	ZZZZZZ	25
13:38	ZZZZZZ	1
13:43	MA52233-CCV7	1 X
13:48	MA52233-CCB7	1 X
13:53	ZZZZZZ	1
13:58	ZZZZZZ	1
14:03	ZZZZZZ	1

(a) Sample used for QC only; not part of login JD42497.

Element: A  
s

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:28	MA52233-STD1	8063 R	231460 R	22667 R	13474 R
08:33	MA52233-STD2	7736	218280	22621	12069
08:38	MA52233-ICV1	7903	235960	22584	12471
08:44	MA52233-ICB1	8057	231380	22743	13449
08:49	MA52233-CCV1	7898	222130	22630	12468
08:54	MA52233-CCB1	8015	230160	22321	13398
08:59	MA52233-CRID1	8073	228290	22327	13447
09:05	MA52233-CRI1	8050	228170	22490	13289
09:10	MA52233-ICSA1	7419	207590	22174	11208
09:15	MA52233-ICSAB1	7418	208150	22206	11203
09:20	ZZZZZZ	22022 !	585660 !	48634 !	34607 !
09:25	ZZZZZZ	22110 !	594320 !	48681 !	34802 !
09:30	MA52233-HSTD1	8027	225790	22542	13290
09:36	MA52233-HSTD2	7492	210400	22139	11223
09:41	MP32280-B1	8076	227630	22890	12935
09:46	ZZZZZZ	7826	222470	21660	13247
09:51	MA52233-CCV2	7856	221780	22303	12446
09:56	MA52233-CCB2	8151	229450	22435	13640
10:01	ZZZZZZ	7795	222420	21661	13263
10:06	ZZZZZZ	7765	221070	21590	13243
10:11	MP32280-MB1	8146	233520	22932	13671
10:16	MP32280-S1	7869	221100	23221	11931
10:21	MP32280-S2	7811	219340	22778	11965
10:26	JD42834-2	7923	222610	23067	12221
10:31	MP32280-SD1	8074	228120	22633	13058
10:36	MP32280-PS1	7858	222400	23142	12065
10:41	MA52233-CCV3	7967	224300	22520	12634
10:46	MA52233-CCB3	8018	216580	21268	13370
10:51	ZZZZZZ	8026	222580	21537	12737
10:56	ZZZZZZ	8136	226350	21846	12816
11:01	ZZZZZZ	8026	224820	22219	11948
11:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
11:11	ZZZZZZ	8047	219080	21524	12785

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
11:16	MA52233-CCV4	7877	219090	21250	12410
11:21	MA52233-CCB4	8005	224240	20823	13315
11:26	MA52233-CRID2	8033	223950	20893	13328
11:31	MP32253-S1	7919	220930	21072	12652
11:36	MP32253-S2	7909	220250	21120	12637
11:41	JD42841-1	7918	221130	20965	12767
11:46	MP32253-SD1	8034	225480	20808	13224
11:51	ZZZZZZ	7836	220010	21057	12509
11:56	ZZZZZZ	7830	215720	20820	12318
12:01	ZZZZZZ	7814	217470	20751	12295
12:06	ZZZZZZ	7911	220610	21037	12190
12:11	MA52233-CCV5	7873	218360	20982	12401
12:16	MA52233-CCB5	8090	224650	20839	13424
12:21	ZZZZZZ	8242	231090	21552	13658
12:26	MA52233-CRI2	7999	223580	20826	13175
12:32	ZZZZZZ	8055	221360	21491	12412
12:37	ZZZZZZ	8312	231850	21689	13756
12:42	ZZZZZZ	7756	210630	21013	11929
12:47	ZZZZZZ	8077	222320	21215	13037
12:52	ZZZZZZ	8211	225470	21534	13073
12:57	ZZZZZZ	8139	222490	21689	12588
13:02	ZZZZZZ	7620	212050	21165	11306
13:07	MA52233-CCV6	8053	222270	21004	12568
13:12	MA52233-CCB6	8231	229560	21318	13541
13:17	MA52233-ICSA2	7570	208600	21182	11361
13:22	MA52233-ICSAB2	7638	207570	21343	11442
13:27	ZZZZZZ	8199	227810	21430	12879
13:33	ZZZZZZ	8106	223850	21276	12874
13:38	ZZZZZZ	8223	226290	21495	12844
13:43	MA52233-CCV7	8050	221870	21318	12533
13:48	MA52233-CCB7	8209	228650	21047	13486
13:53	ZZZZZZ	7876	220470	20545	13241
13:58	ZZZZZZ	7925	219230	20418	13126

# INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52233  
 Parameters: As

Sample					
Time	Description	Istd#1	Istd#2	Istd#3	Istd#4
14:03	ZZZZZZ	8291	230240	21556	13568

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

6.7.2  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52233 Units: ug/l

Time: Sample ID:			08:44 ICB1		08:54 CCB1		09:56 CCB2		10:46 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.00	<3.0	-0.800	<3.0	-0.100	<3.0	0.500	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52233 Units: ug/l

Time: Sample ID:			08:44 ICB1		08:54 CCB1		09:56 CCB2		10:46 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52233 Units: ug/l

Time: Sample ID:			11:21 CCB4		12:16 CCB5		13:12 CCB6		13:48 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.100	<3.0	0.100	<3.0	0.200	<3.0	0.00	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52233 Units: ug/l

Time: Sample ID:			11:21 CCB4		12:16 CCB5		13:12 CCB6		13:48 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time: Sample ID:		ICV	08:38 ICV1	% Rec	CCV True	08:49 CCV1	% Rec	CCV True	09:51 CCV2	% Rec
Metal		True	Results			Results			Results	
Aluminum	anr									
Antimony	anr									
Arsenic	2000		2000	100.0	2000	2040	102.0	2000	2040	102.0
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	anr									
Calcium	anr									
Cerium										
Chromium	anr									
Cobalt	anr									
Copper	anr									
Iron	anr									
Lead	anr									
Lithium										
Magnesium	anr									
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur										
Thallium	anr									
Tin										
Titanium										
Tungsten										
Vanadium	anr									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time:		08:38			08:49			09:51		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.7.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time: Sample ID:		10:41 CCV3		11:16 CCV4		12:11 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2020	101.0	2000	1980	99.0	2000	1950	97.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time:		10:41			11:16			12:11		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.7.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time: Sample ID:		13:07 CCV6	% Rec	13:43 CCV7	% Rec
Metal	True	Results		Results	
Aluminum	anr				
Antimony	anr				
Arsenic	2000	1920	96.0	2000	1970
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time:		13:07			13:43		
Sample ID:	CCV	CCV6		CCV	CCV7		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

## HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		09:30		09:36	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	HSTD	Results
	True			True	% Rec
Aluminum					
Antimony	anr				
Arsenic	8000	7570	94.6		
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron					
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52233 Units: ug/l

Time:		09:30		09:36	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.7.5

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52233 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	08:59 CRID1		09:05 CRI1		11:26 CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0			7.70	96.3	2.50	83.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0						
Iron	100	500							
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52233 Units: ug/l

Time:					08:59		09:05		11:26	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	CRID1	Results	% Rec	CRID2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.7.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52233 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	12:26 CRI2	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100	anr	
Antimony	6.0	20	3.0	anr	
Arsenic	8.0	20	3.0	9.50	118.8
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	anr	
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	
Cobalt	50		3.0	anr	
Copper	10		2.0	anr	
Iron	100	500		anr	
Lead	3.0	20	2.5	anr	
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0	anr	
Silicon	200				
Silver	5.0		2.0	anr	
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0	anr	
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	anr	

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120%    CRIA 80-120%      Run ID: MA52233      Units: ug/l

Time:				12:26	
Sample ID:	CRI	CRIA	CRID	CRI2	
Metal	True	True	True	Results	% Rec

Zinc	20		10	anr	
Zirconium	10				

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.7.6  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52233      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	09:10 ICSAB1 Results	% Rec	09:15 ICSAB1 Results	% Rec	13:17 ICSAB2 Results	% Rec	13:22 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	521000	104.2	522000	104.4	507000	101.4	507000	101.4
Antimony		1000	1.60		983	98.3	3.00		911	91.1
Arsenic		1000	-0.500		973	97.3	-0.400		927	92.7
Barium		500	6.30		469	93.8	6.00		455	91.0
Beryllium		500	0.100		466	93.2	0.100		441	88.2
Bismuth		500	8.60		482	96.4	11.6		445	89.0
Boron		500	-0.500		462	92.4	0.00		430	86.0
Cadmium		1000	0.300		977	97.7	0.00		908	90.8
Calcium	400000	400000	392000	98.0	406000	101.5	388000	97.0	388000	97.0
Cerium			27.9		492*		27.0		476*	
Chromium		500	-0.900		454	90.8	-0.900		452	90.4
Cobalt		500	0.600		467	93.4	0.800		450	90.0
Copper		500	2.40		485	97.0	1.10		449	89.8
Iron	200000	200000	199000	99.5	210000	105.0	194000	97.0	204000	102.0
Lead		1000	0.900		913	91.3	0.00		889	88.9
Lithium		500	-7.00		537	107.4	-7.50		511	102.2
Magnesium	500000	500000	513000	102.6	503000	100.6	501000	100.2	491000	98.2
Manganese		500	0.200		485	97.0	-0.100		476	95.2
Molybdenum		500	-1.90		463	92.6	-2.30		440	88.0
Nickel		1000	-1.00		902	90.2	-1.30		876	87.6
Phosphorus		500	-21.0		435	87.0	-29.3		411	82.2
Potassium			-384		-400		-383		-418	
Selenium		1000	5.70		890	89.0	8.00		845	84.5
Silicon		500	8.30		510	102.0	4.80		479	95.8
Silver		1000	4.50		1020	102.0	4.10		972	97.2
Sodium			92.4		118		78.9		97.4	
Strontium		500	-1.40		464	92.8	-1.60		444	88.8
Sulfur		500	-11.2		454	90.8	-18.6		422	84.4
Thallium		1000	-0.500		906	90.6	1.10		870	87.0
Tin		500	-6.10		453	90.6	-6.70		435	87.0
Titanium		500	-1.80		473	94.6	-1.90		462	92.4
Tungsten		500	-3.40		476	95.2	-3.20		464	92.8
Vanadium		500	2.20		472	94.4	3.10		463	92.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52233 Units: ug/l

Time:				09:10		09:15		13:17		13:22	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2		
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	
Zinc		1000	2.60		906	90.6	2.80		897	89.7	
Zirconium		500	-1.80		423	84.6	-1.70		410	82.0	
(*) Outside of QC limits											
(anr) Analyte not requested											
</											

6.7.7

6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/07/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	.92	8.1		
Antimony	2.0	.28	.41		
Arsenic	2.0	.26	.28	0.64	<2.0
Barium	20	.02	1.9		
Beryllium	0.20	.02	.08		
Bismuth	2.0	.25	.52		
Boron	10	.18	3.7		
Cadmium	0.50	.04	.07		
Calcium	500	1.3	21		
Chromium	1.0	.07	.37		
Cobalt	5.0	.06	.28		
Copper	2.5	.07	.84		
Iron	50	.33	19	18.4	<50
Lead	2.0	.2	.41		
Lithium	5.0	.15	.92		
Magnesium	500	2.5	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.06	.32		
Nickel	4.0	.08	.35		
Phosphorus	20	.7	3.3		
Potassium	1000	3.5	32		
Selenium	2.0	.36	.65		
Silicon	20	.22	11		
Silver	0.50	.06	.17		
Sodium	1000	1.4	78		
Strontium	5.0	.01	.18		
Sulfur	10	.37	3.9		
Thallium	1.0	.52	.58		
Tin	20	.14	3.8		
Titanium	1.0	.08	.34		
Tungsten	5.0	.13	1.8		
Vanadium	5.0	.05	.19		
Zinc	5.0	.03	2.3		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/07/22

Metal	RL	IDL	MDL	MB raw	final
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Zirconium 2.0 .05 .54

Associated samples MP32168: JD42497-1, JD42497-2, JD42497-3, JD42497-4, JD42497-5, JD42497-6, JD42497-7, JD42497-8, JD42497-9, JD42497-10, JD42497-11, JD42497-12, JD42497-13, JD42497-14, JD42497-15

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



## 6.8.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: mg/kg

04/07/22

Metal	JD42497-6 Original MS		Spikelot MPSPK2		% Rec	QC Limits
Aluminum						
Antimony						
Arsenic	5.8	212	224	92.1	75-125	
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron	16200	20400	2800	150.0(a)	75-125	
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	JD42497-6 Original MS	SpikeLot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP32168: JD42497-1, JD42497-2, JD42497-3, JD42497-4, JD42497-5, JD42497-6, JD42497-7, JD42497-8, JD42497-9, JD42497-10, JD42497-11, JD42497-12, JD42497-13, JD42497-14, JD42497-15

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	JD42497-6 Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	5.8	203	226	87.2	4.3	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron	16200	20500	2830	152.1(a)	0.5	20
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	JD42497-6 Original MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP32168: JD42497-1, JD42497-2, JD42497-3, JD42497-4, JD42497-5, JD42497-6, JD42497-7, JD42497-8, JD42497-9, JD42497-10, JD42497-11, JD42497-12, JD42497-13, JD42497-14, JD42497-15

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## 6.8.3 6

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/07/22



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP32168: JD42497-1, JD42497-2, JD42497-3, JD42497-4, JD42497-5, JD42497-6, JD42497-7, JD42497-8, JD42497-9, JD42497-10, JD42497-11, JD42497-12, JD42497-13, JD42497-14, JD42497-15

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/07/22

Metal	JD42497-6		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	50.6	47.9	5.3	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron	142000	158000	11.8*(a)	0-10
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/07/22

JD42497-6		QC
Metal	Original SDL 1:5 %DIF	Limits

Zirconium

Associated samples MP32168: JD42497-1, JD42497-2, JD42497-3, JD42497-4, JD42497-5, JD42497-6, JD42497-7, JD42497-8, JD42497-9, JD42497-10, JD42497-11, JD42497-12, JD42497-13, JD42497-14, JD42497-15

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested  
 (a) Serial dilution indicates possible matrix interference.

6.8.4  
 6



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/09/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	2.6	8		
Antimony	2.0	.22	.41		
Arsenic	2.0	.13	.28	0.0099	<2.0
Barium	20	.099	1.9		
Beryllium	0.20	.02	.079		
Bismuth	2.0	.21	.51		
Boron	9.9	.099	3.7		
Cadmium	0.50	.02	.069		
Calcium	500	.76	21		
Chromium	0.99	.05	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.67	.83		
Iron	50	1.4	19	3.3	<50
Lead	2.0	.16	.41		
Lithium	5.0	.37	.91		
Magnesium	500	5.3	14		
Manganese	1.5	.0099	.41		
Molybdenum	2.0	.05	.32		
Nickel	4.0	.03	.35		
Phosphorus	20	.18	3.2		
Potassium	990	7.6	31		
Selenium	2.0	.2	.64		
Silicon	20	.13	11		
Silver	0.50	.089	.17		
Sodium	990	2.3	77		
Strontium	5.0	.04	.18		
Sulfur	9.9	.41	3.8		
Thallium	0.99	.16	.57		
Tin	20	.089	3.8		
Titanium	0.99	.089	.34		
Tungsten	5.0	.2	1.7		
Vanadium	5.0	.079	.19		
Zinc	15	.02	2.3		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/09/22

Metal	RL	IDL	MDL	MB raw	final
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Zirconium 2.0 .05 .53

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	JD42497-24 Original MS		Spikelot MPSPK2		% Rec	QC Limits
Aluminum	anr				94.7	75-125
Antimony	anr					
Arsenic	21.1	246	238			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr				471.5(a)	75-125
Copper	anr					
Iron	37200	51200	2970			
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	JD42497-24 Original MS	Spike lot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

6.9.2

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	JD42497-24 Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	21.1	208	238	78.7	16.7	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	37200	31400	2970	-195.3(a	47.9 (b)	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	JD42497-24 Original MSD	Spike lot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) High rpd due to possible sample nonhomogeneity.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224

Methods: SW846 6010D

Matrix Type: SOLID

Units: mg/kg

Prep Date:

04/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	191	198	96.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2500	2480	101.0	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/09/22

Metal		JD42497-24 Original SDL 1:5		%DIF	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	178	170	4.5	0-10	
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	314000	322000	2.6	0-10	
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/09/22

	JD42497-24		QC
Metal	Original SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.9.4

6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/09/22

Metal	Sample ml	Final ml	JD42497-24 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic	19.25	20	177.5	170.8438	2331	0.2	200	2000	108.0	80-120
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Phosphorus										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Strontium										
Sulfur										
Thallium										
Tin										
Titanium										
Tungsten										
Vanadium										
Zinc										

POST DIGESTATE SPIKE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/09/22

Metal	Sample ml	Final ml	JD42497-24 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Zirconium

Associated samples MP32224: JD42497-22, JD42497-23, JD42497-24, JD42497-26, JD42497-27, JD42497-29, JD42497-30

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.7	8.1		
Antimony	2.0	.17	.41		
Arsenic	2.0	.21	.28	-0.020	<2.0
Barium	20	.08	1.9		
Beryllium	0.20	.03	.08		
Bismuth	2.0	.23	.52		
Boron	10	.23	3.7		
Cadmium	0.50	.03	.07		
Calcium	500	.66	21		
Chromium	1.0	.03	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.08	.84		
Iron	50	.53	19	3.1	<50
Lead	2.0	.11	.41		
Lithium	5.0	.48	.92		
Magnesium	500	3.2	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.06	.32		
Nickel	4.0	.04	.35		
Phosphorus	20	.12	3.3		
Potassium	1000	7.7	32		
Selenium	2.0	.32	.65		
Silicon	20	.17	11		
Silver	0.50	.1	.17		
Sodium	1000	3.4	78		
Strontium	5.0	.03	.18		
Sulfur	10	.3	3.9		
Thallium	1.0	.18	.58		
Tin	20	.08	3.8		
Titanium	1.0	.05	.34		
Tungsten	5.0	.26	1.8		
Vanadium	5.0	.06	.19		
Zinc	5.0	.01	2.3		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/12/22

Metal	RL	IDL	MDL	MB raw	final
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Zirconium 2.0 .03 .54

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

6.10.1

6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	JD42748-1 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	3.1	185	223	81.4 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	16900	28000	2790	300.7(a) 75-125
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	JD42748-1 Original MS	SpikeLot MPSPK2	% Rec	QC Limits
-------	--------------------------	--------------------	-------	--------------

Zirconium

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

6.10.2

6



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	JD42748-1 Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	3.1	180	228	77.6	2.7	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	16900	21800	2850	77.2	24.9 (a)	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur	anr					
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	JD42748-1 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) High rpd due to possible sample nonhomogeneity.

6.10.2

6

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248

Methods: SW846 6010D

Matrix Type: SOLID

Units: mg/kg

Prep Date: 04/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	176	198	88.9	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2370	2480	95.7	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.10.3

6

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42748-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	25.9	31.2	20.5 (a)	0-10
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	172000	170000	9.4	0-10
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

	JD42748-1		QC
Metal	Original SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

6.10.4

6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/12/22

Metal	Sample ml	Final ml	JD42748-1 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Phosphorus										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Strontium										
Sulfur										
Thallium										
Tin										
Titanium										
Tungsten										
Vanadium										
Zinc										

POST DIGESTATE SPIKE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/12/22

Metal	Sample ml	Final ml	JD42748-1 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
-------	--------------	-------------	------------------	---------------	------	-------------	----------------	---------------	-------	--------------

Zirconium

Associated samples MP32248: JD42497-25

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

6.10.5

6



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 04/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.10	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32	23.8	<100
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 04/12/22

Metal	RL	IDL	MDL	MB raw	final
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Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP32253: JD42497-28

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original MS		Spikelot MPSPK2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	0.0	1920	2000	95.4	75-125
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron	15800	42500	25000	106.8	75-125
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	anr				
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original MS	SpikeLot MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP32253: JD42497-28

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0	1900	2000	95.0	1.0	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron	15800	41900	25000	104.4	1.4	20
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	anr					
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	---------------------------	--------------------	-------	------------	-------------

Zinc

Zirconium

Associated samples MP32253: JD42497-28

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## 6.11.3



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP32253: JD42497-28

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.3

6



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	0.00	0.00	NC	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	15800	16000	1.3	0-10
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1	QC	
	Original SDL 1:5	%DIF	Limits

Zinc

Zirconium

Associated samples MP32253: JD42497-28

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.11.4

6

## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Percent Solids Raw Data Summary

## Percent Solids Raw Data Summary

Page 1 of 4

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD42497-1      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_0-5\_20220404

Wet Weight (Total)	30.6	g
Tare Weight	24.12	g
Dry Weight (Total)	29.07	g
Solids, Percent	76.4	%

---

**Sample:** JD42497-2      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_0-5\_20220404

Wet Weight (Total)	31.72	g
Tare Weight	23.45	g
Dry Weight (Total)	29.86	g
Solids, Percent	77.5	%

---

**Sample:** JD42497-3      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_5-10\_20220405

Wet Weight (Total)	27.92	g
Tare Weight	22.17	g
Dry Weight (Total)	25.92	g
Solids, Percent	65.2	%

---

**Sample:** JD42497-4      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_10-15\_20220405

Wet Weight (Total)	26.11	g
Tare Weight	20.08	g
Dry Weight (Total)	24.26	g
Solids, Percent	69.3	%

---

**Sample:** JD42497-5      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_15-20\_20220405

Wet Weight (Total)	36.11	g
Tare Weight	28.09	g
Dry Weight (Total)	34.69	g
Solids, Percent	82.3	%

---

**Sample:** JD42497-6      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_20-25\_20220405

Wet Weight (Total)	31.32	g
Tare Weight	25.32	g
Dry Weight (Total)	30.68	g
Solids, Percent	89.3	%

---

## Percent Solids Raw Data Summary

Page 2 of 4

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD42497-7      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_25-30\_20220405

Wet Weight (Total)	23.91	g
Tare Weight	18.57	g
Dry Weight (Total)	22.19	g
Solids, Percent	67.8	%

---

**Sample:** JD42497-8      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_30-35\_20220405

Wet Weight (Total)	30.52	g
Tare Weight	25.13	g
Dry Weight (Total)	28.71	g
Solids, Percent	66.4	%

---

**Sample:** JD42497-9      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_0-5\_20220404

Wet Weight (Total)	36.85	g
Tare Weight	30.34	g
Dry Weight (Total)	36.01	g
Solids, Percent	87.1	%

---

**Sample:** JD42497-10      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_5-10\_20220404

Wet Weight (Total)	29.2	g
Tare Weight	23.72	g
Dry Weight (Total)	27.84	g
Solids, Percent	75.2	%

---

**Sample:** JD42497-11      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_10-15\_20220404

Wet Weight (Total)	24.19	g
Tare Weight	18.91	g
Dry Weight (Total)	22.07	g
Solids, Percent	59.8	%

---

**Sample:** JD42497-12      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_15-20\_20220404

Wet Weight (Total)	26.92	g
Tare Weight	21.43	g
Dry Weight (Total)	25.46	g
Solids, Percent	73.4	%

---

## Percent Solids Raw Data Summary

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**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD42497-13      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_20-25\_20220404

Wet Weight (Total)	31.89	g
Tare Weight	25.09	g
Dry Weight (Total)	29.5	g
Solids, Percent	64.9	%

---

**Sample:** JD42497-14      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7-BH-22-001\_25-30\_20220404

Wet Weight (Total)	31.38	g
Tare Weight	25.41	g
Dry Weight (Total)	28.78	g
Solids, Percent	56.4	%

---

**Sample:** JD42497-15      **Analyzed:** 06-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D\_35-40\_20220405

Wet Weight (Total)	33.87	g
Tare Weight	27.79	g
Dry Weight (Total)	31.77	g
Solids, Percent	65.5	%

---

**Sample:** JD42497-22      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_5-10\_20220406

Wet Weight (Total)	31.56	g
Tare Weight	25.14	g
Dry Weight (Total)	30.18	g
Solids, Percent	78.5	%

---

**Sample:** JD42497-23      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_10-15\_20220406

Wet Weight (Total)	28.35	g
Tare Weight	20.22	g
Dry Weight (Total)	26.73	g
Solids, Percent	80.1	%

---

**Sample:** JD42497-24      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_15-20\_20220406

Wet Weight (Total)	30.26	g
Tare Weight	24.11	g
Dry Weight (Total)	29.29	g
Solids, Percent	84.2	%

---

## Percent Solids Raw Data Summary

Page 4 of 4

**Job Number:** JD42497  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD42497-25      **Analyzed:** 11-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_20-25\_20220406

Wet Weight (Total)	26.77	g
Tare Weight	18.88	g
Dry Weight (Total)	25.77	g
Solids, Percent	87.3	%

---

**Sample:** JD42497-26      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_25-30\_20220406

Wet Weight (Total)	36.6	g
Tare Weight	27.72	g
Dry Weight (Total)	34.85	g
Solids, Percent	80.3	%

---

**Sample:** JD42497-27      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_30-35\_20220406

Wet Weight (Total)	28.3	g
Tare Weight	22.82	g
Dry Weight (Total)	26.45	g
Solids, Percent	66.2	%

---

**Sample:** JD42497-29      **Analyzed:** 11-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_15-20\_FD\_20220406

Wet Weight (Total)	29.8	g
Tare Weight	22.36	g
Dry Weight (Total)	28.76	g
Solids, Percent	86	%

---

**Sample:** JD42497-30      **Analyzed:** 10-APR-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D\_35-40\_20220406

Wet Weight (Total)	29.56	g
Tare Weight	22.63	g
Dry Weight (Total)	27.4	g
Solids, Percent	68.8	%

---

The results set forth herein are provided by SGS North America Inc.

***e-Hardcopy 2.0***  
***Automated Report***

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD42497A

Sampling Dates: 04/04/22 - 04/06/22



Report to:

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ATTN: Chelsey Shepsko

Total number of pages in report: **41**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Mike Earp  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.



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## Sample Summary

Sunoco/Evergreen

Job No: JD42497A

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD42497-16	04/05/22	11:20 LRT	04/05/22	SO	Soil	MW-609D_10-15_20220405
JD42497-16A	04/05/22	11:20 LRT	04/05/22	SO	Soil	MW-609D_10-15_20220405
JD42497-17	04/05/22	11:25 LRT	04/05/22	SO	Soil	MW-609D_20-25_20220405
JD42497-17A	04/05/22	11:25 LRT	04/05/22	SO	Soil	MW-609D_20-25_20220405
JD42497-18	04/05/22	11:30 LRT	04/05/22	SO	Soil	MW-609D_25-30_20220405
JD42497-18A	04/05/22	11:30 LRT	04/05/22	SO	Soil	MW-609D_25-30_20220405
JD42497-19	04/04/22	14:50 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_5-10_20220404
JD42497-19A	04/04/22	14:50 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_5-10_20220404
JD42497-20	04/04/22	15:00 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_15-20_20220404
JD42497-20A	04/04/22	15:00 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_15-20_20220404
JD42497-21	04/04/22	15:20 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_25-30_20220404
JD42497-21A	04/04/22	15:20 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_25-30_20220404
JD42497-23A	04/06/22	08:45 LRT	04/06/22	SO	Soil	MW-608D_10-15_20220406

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD42497A

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD42497-25A	04/06/22	08:55 LRT	04/06/22	SO	Soil	MW-608D_20-25_20220406
JD42497-26A	04/06/22	09:00 LRT	04/06/22	SO	Soil	MW-608D_25-30_20220406

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

Page 1 of 4

**Job Number:** JD42497A  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD42497-16 MW-609D\_10-15\_20220405

BOD, 5 Day <sup>a</sup>	4670	59		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	64200	2700		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	126000	140		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-16A MW-609D\_10-15\_20220405

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	100		%	ASTM D422-63
0.375 Inch Sieve	100		%	ASTM D422-63
No.4 Sieve (4.75 mm)	94.4		%	ASTM D422-63
No.8 Sieve (2.36 mm)	84.6		%	ASTM D422-63
No.10 Sieve (2.00 mm)	82.4		%	ASTM D422-63
No.16 Sieve (1.18 mm)	80.5		%	ASTM D422-63
No.30 Sieve (0.60 mm)	78.1		%	ASTM D422-63
No.50 Sieve (0.30 mm)	70.9		%	ASTM D422-63
No.100 Sieve (0.15 mm)	60.1		%	ASTM D422-63
No.200 Sieve (0.075 mm)	56.5		%	ASTM D422-63
0.030 mm (Hydrometer)	43		%	ASTM D422-63
0.005 mm (Hydrometer)	18		%	ASTM D422-63
% Gravel	5.6		%	ASTM D422-63
% Sand	37.9		%	ASTM D422-63
% Silt, Clay, Colloids	56.5		%	ASTM D422-63

### JD42497-17 MW-609D\_20-25\_20220405

BOD, 5 Day <sup>a</sup>	1050	50		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	84500	2400		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	19200	120		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-17A MW-609D\_20-25\_20220405

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	89.7		%	ASTM D422-63
0.375 Inch Sieve	75.5		%	ASTM D422-63
No.4 Sieve (4.75 mm)	53.8		%	ASTM D422-63
No.8 Sieve (2.36 mm)	36.0		%	ASTM D422-63
No.10 Sieve (2.00 mm)	32.9		%	ASTM D422-63
No.16 Sieve (1.18 mm)	31.1		%	ASTM D422-63
No.30 Sieve (0.60 mm)	28.5		%	ASTM D422-63
No.50 Sieve (0.30 mm)	24.1		%	ASTM D422-63
No.100 Sieve (0.15 mm)	19.9		%	ASTM D422-63

## Summary of Hits

**Job Number:** JD42497A  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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No.200 Sieve (0.075 mm)		18.4			%	ASTM D422-63
0.030 mm (Hydrometer)		11			%	ASTM D422-63
0.005 mm (Hydrometer)		5.0			%	ASTM D422-63
% Gravel		46.2			%	ASTM D422-63
% Sand		35.3			%	ASTM D422-63
% Silt, Clay, Colloids		18.4			%	ASTM D422-63

### JD42497-18 MW-609D\_25-30\_20220405

BOD, 5 Day <sup>a</sup>	2990	57		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	42200	2500		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	30400	140		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-18A MW-609D\_25-30\_20220405

3 Inch Sieve	100			%	ASTM D422-63
1.5 Inch Sieve	100			%	ASTM D422-63
0.75 Inch Sieve	100			%	ASTM D422-63
0.375 Inch Sieve	100			%	ASTM D422-63
No.4 Sieve (4.75 mm)	98.8			%	ASTM D422-63
No.8 Sieve (2.36 mm)	94.8			%	ASTM D422-63
No.10 Sieve (2.00 mm)	92.7			%	ASTM D422-63
No.16 Sieve (1.18 mm)	91.5			%	ASTM D422-63
No.30 Sieve (0.60 mm)	89.2			%	ASTM D422-63
No.50 Sieve (0.30 mm)	86.2			%	ASTM D422-63
No.100 Sieve (0.15 mm)	80.5			%	ASTM D422-63
No.200 Sieve (0.075 mm)	76.8			%	ASTM D422-63
0.030 mm (Hydrometer)	50			%	ASTM D422-63
0.005 mm (Hydrometer)	24			%	ASTM D422-63
0.0015 mm (Hydrometer)	14			%	ASTM D422-63
% Gravel	1.2			%	ASTM D422-63
% Sand	22.0			%	ASTM D422-63
% Silt, Clay, Colloids	76.8			%	ASTM D422-63

### JD42497-19 AOI7-BH-22-001\_5-10\_20220404

BOD, 5 Day <sup>b</sup>	4820	65		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	177000	2800		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	66900	150		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-19A AOI7-BH-22-001\_5-10\_20220404

3 Inch Sieve	100			%	ASTM D422-63
1.5 Inch Sieve	100			%	ASTM D422-63
0.75 Inch Sieve	100			%	ASTM D422-63

## Summary of Hits

**Job Number:** JD42497A  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
0.375 Inch Sieve		93.4			%	ASTM D422-63
No.4 Sieve (4.75 mm)		85.3			%	ASTM D422-63
No.8 Sieve (2.36 mm)		78.0			%	ASTM D422-63
No.10 Sieve (2.00 mm)		73.5			%	ASTM D422-63
No.16 Sieve (1.18 mm)		71.2			%	ASTM D422-63
No.30 Sieve (0.60 mm)		68.3			%	ASTM D422-63
No.50 Sieve (0.30 mm)		62.6			%	ASTM D422-63
No.100 Sieve (0.15 mm)		54.3			%	ASTM D422-63
No.200 Sieve (0.075 mm)		50.7			%	ASTM D422-63
0.030 mm (Hydrometer)		40			%	ASTM D422-63
0.005 mm (Hydrometer)		15			%	ASTM D422-63
% Gravel		14.7			%	ASTM D422-63
% Sand		34.6			%	ASTM D422-63
% Silt, Clay, Colloids		50.7			%	ASTM D422-63

### JD42497-20 AOI7-BH-22-001\_15-20\_20220404

BOD, 5 Day <sup>b</sup>	2530	61	mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	140000	3000	mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	46700	150	mg/kg	LLOYD KAHN 1988 MOD

### JD42497-20A AOI7-BH-22-001\_15-20\_20220404

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	100		%	ASTM D422-63
0.375 Inch Sieve	100		%	ASTM D422-63
No.4 Sieve (4.75 mm)	97.3		%	ASTM D422-63
No.8 Sieve (2.36 mm)	92.4		%	ASTM D422-63
No.10 Sieve (2.00 mm)	89.5		%	ASTM D422-63
No.16 Sieve (1.18 mm)	88.5		%	ASTM D422-63
No.30 Sieve (0.60 mm)	87.0		%	ASTM D422-63
No.50 Sieve (0.30 mm)	83.7		%	ASTM D422-63
No.100 Sieve (0.15 mm)	75.5		%	ASTM D422-63
No.200 Sieve (0.075 mm)	72.1		%	ASTM D422-63
0.030 mm (Hydrometer)	63		%	ASTM D422-63
0.005 mm (Hydrometer)	25		%	ASTM D422-63
% Gravel	2.8		%	ASTM D422-63
% Sand	25.2		%	ASTM D422-63
% Silt, Clay, Colloids	72.1		%	ASTM D422-63

### JD42497-21 AOI7-BH-22-001\_25-30\_20220404

BOD, 5 Day <sup>b</sup>	9650	74	mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	210000	3500	mg/kg	SM5220C11M,HACH8000M

## Summary of Hits

**Job Number:** JD42497A  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 04/04/22 thru 04/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Total Organic Carbon		109000	180		mg/kg	LLOYD KAHN 1988 MOD
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### JD42497-21A AOI7-BH-22-001\_25-30\_20220404

3 Inch Sieve	100			%	ASTM D422-63
1.5 Inch Sieve	100			%	ASTM D422-63
0.75 Inch Sieve	100			%	ASTM D422-63
0.375 Inch Sieve	100			%	ASTM D422-63
No.4 Sieve (4.75 mm)	99.8			%	ASTM D422-63
No.8 Sieve (2.36 mm)	99.6			%	ASTM D422-63
No.10 Sieve (2.00 mm)	99.1			%	ASTM D422-63
No.16 Sieve (1.18 mm)	93.5			%	ASTM D422-63
No.30 Sieve (0.60 mm)	87.7			%	ASTM D422-63
No.50 Sieve (0.30 mm)	86.4			%	ASTM D422-63
No.100 Sieve (0.15 mm)	85.3			%	ASTM D422-63
No.200 Sieve (0.075 mm)	84.5			%	ASTM D422-63
0.030 mm (Hydrometer)	76			%	ASTM D422-63
0.005 mm (Hydrometer)	31			%	ASTM D422-63
% Gravel	0.24			%	ASTM D422-63
% Sand	15.2			%	ASTM D422-63
% Silt, Clay, Colloids	84.6			%	ASTM D422-63

### JD42497-23A MW-608D\_10-15\_20220406

BOD, 5 Day <sup>b</sup>	1770	55		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	124000	2600		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	116000	130		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-25A MW-608D\_20-25\_20220406

BOD, 5 Day <sup>b</sup>	367	50		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	45100	2400		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	9730	120		mg/kg	LLOYD KAHN 1988 MOD

### JD42497-26A MW-608D\_25-30\_20220406

BOD, 5 Day <sup>b</sup>	951	51		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	15200	2400		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	10400	120		mg/kg	LLOYD KAHN 1988 MOD

(a) High RPD of results from multiple dilution indicates possible matrix interference.

(b) Analysis done out of holding time.

## Sample Results

### Report of Analysis



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_10-15_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-16	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	71.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	4670	59	mg/kg	1	04/06/22 19:50	DB	SM5210 B-11 M
Chemical Oxygen Demand	64200	2700	mg/kg	1	04/11/22 14:22	MP	SM5220C11M,HACH8000M
Solids, Percent	71.5		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	126000	140	mg/kg	1	04/12/22 10:40	MB	LLOYD KAHN 1988 MOD

(a) High RPD of results from multiple dilution indicates possible matrix interference.

RL = Reporting Limit

## Report of Analysis

Client Sample ID: MW-609D\_10-15\_20220405

Lab Sample ID: JD42497-16A

Matrix: SO - Soil

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 71.5

Project: SANHPAFW: Marcus Hook, PA

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	94.4		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	84.6		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	82.4		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	80.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	78.1		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	70.9		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	60.1		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	56.5		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	43		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	18		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	5.6		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	37.9		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	56.5		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20-25_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-17	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	83.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	1050	50	mg/kg	1	04/06/22 19:52	DB	SM5210 B-11 M
Chemical Oxygen Demand	84500	2400	mg/kg	1	04/11/22 14:24	MP	SM5220C11M,HACH8000M
Solids, Percent	83.9		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	19200	120	mg/kg	1	04/11/22 13:58	MB	LLOYD KAHN 1988 MOD

(a) High RPD of results from multiple dilution indicates possible matrix interference.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** MW-609D\_20-25\_20220405**Lab Sample ID:** JD42497-17A**Matrix:** SO - Soil**Date Sampled:** 04/05/22**Date Received:** 04/05/22**Percent Solids:** 83.9**Project:** SANHPAFW: Marcus Hook, PA

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	89.7		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	75.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	53.8		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	36.0		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	32.9		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	31.1		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	28.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	24.1		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	19.9		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	18.4		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	11		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	5.0		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	46.2		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	35.3		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	18.4		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_25-30_20220405	<b>Date Sampled:</b>	04/05/22
<b>Lab Sample ID:</b>	JD42497-18	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	74.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	2990	57	mg/kg	1	04/06/22 19:48	DB	SM5210 B-11 M
Chemical Oxygen Demand	42200	2500	mg/kg	1	04/11/22 14:26	MP	SM5220C11M,HACH8000M
Solids, Percent	74		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	30400	140	mg/kg	1	04/11/22 14:14	MB	LLOYD KAHN 1988 MOD

(a) High RPD of results from multiple dilution indicates possible matrix interference.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** MW-609D\_25-30\_20220405**Lab Sample ID:** JD42497-18A**Matrix:** SO - Soil**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 04/05/22**Date Received:** 04/05/22**Percent Solids:** 74.0

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	98.8		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	94.8		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	92.7		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	91.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	89.2		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	86.2		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	80.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	76.8		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	50		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	24		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	14		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	1.2		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	22.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	76.8		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_5-10_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-19	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	4820	65	mg/kg	1	04/06/22 19:56	DB	SM5210 B-11 M
Chemical Oxygen Demand	177000	2800	mg/kg	1	04/11/22 14:28	MP	SM5220C11M,HACH8000M
Solids, Percent	64.9		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	66900	150	mg/kg	1	04/12/22 10:53	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** AOI7-BH-22-001\_5-10\_20220404**Lab Sample ID:** JD42497-19A**Matrix:** SO - Soil**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 04/04/22**Date Received:** 04/05/22**Percent Solids:** 64.9

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	93.4		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	85.3		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	78.0		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	73.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	71.2		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	68.3		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	62.6		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	54.3		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	50.7		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	40		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	15		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	14.7		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	34.6		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	50.7		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_15-20_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-20	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	68.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	2530	61	mg/kg	1	04/06/22 19:58	DB	SM5210 B-11 M
Chemical Oxygen Demand	140000	3000	mg/kg	1	04/11/22 14:30	MP	SM5220C11M,HACH8000M
Solids, Percent	68.4		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	46700	150	mg/kg	1	04/12/22 11:05	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** AOI7-BH-22-001\_15-20\_20220404**Lab Sample ID:** JD42497-20A**Matrix:** SO - Soil**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 04/04/22**Date Received:** 04/05/22**Percent Solids:** 68.4**General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	97.3		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	92.4		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	89.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	88.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	87.0		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	83.7		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	75.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	72.1		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	63		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	25		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	2.8		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	25.2		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	72.1		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	AOI7-BH-22-001_25-30_20220404	<b>Date Sampled:</b>	04/04/22
<b>Lab Sample ID:</b>	JD42497-21	<b>Date Received:</b>	04/05/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	56.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	9650	74	mg/kg	1	04/06/22 20:00	DB	SM5210 B-11 M
Chemical Oxygen Demand	210000	3500	mg/kg	1	04/11/22 14:32	MP	SM5220C11M,HACH8000M
Solids, Percent	56.5		%	1	04/06/22 16:03	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	109000	180	mg/kg	1	04/12/22 11:18	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** AOI7-BH-22-001\_25-30\_20220404**Lab Sample ID:** JD42497-21A**Matrix:** SO - Soil**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 04/04/22**Date Received:** 04/05/22**Percent Solids:** 56.5**General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>Particle Size Analysis (Sieve and Hydrometer Testing)</b>							
3 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
0.375 Inch Sieve	100		%	1	04/21/22 10:01	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	99.8		%	1	04/21/22 10:01	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	99.6		%	1	04/21/22 10:01	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	99.1		%	1	04/21/22 10:01	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	93.5		%	1	04/21/22 10:01	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	87.7		%	1	04/21/22 10:01	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	86.4		%	1	04/21/22 10:01	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	85.3		%	1	04/21/22 10:01	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	84.5		%	1	04/21/22 10:01	DB	ASTM D422-63
0.030 mm (Hydrometer)	76		%	1	04/21/22 10:01	DB	ASTM D422-63
0.005 mm (Hydrometer)	31		%	1	04/21/22 10:01	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	04/21/22 10:01	DB	ASTM D422-63
% Gravel	0.24		%	1	04/21/22 10:01	DB	ASTM D422-63
% Sand	15.2		%	1	04/21/22 10:01	DB	ASTM D422-63
% Silt, Clay, Colloids	84.6		%	1	04/21/22 10:01	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_10-15_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-23A	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	76.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	1770	55	mg/kg	1	04/08/22 18:10	DB	SM5210 B-11 M
Chemical Oxygen Demand	124000	2600	mg/kg	1	04/11/22 14:34	MP	SM5220C11M,HACH8000M
Solids, Percent	76		%	1	04/11/22 16:24	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	116000	130	mg/kg	1	04/12/22 11:30	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20-25_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-25A	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	83.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	367	50	mg/kg	1	04/08/22 18:11	DB	SM5210 B-11 M
Chemical Oxygen Demand	45100	2400	mg/kg	1	04/11/22 14:36	MP	SM5220C11M,HACH8000M
Solids, Percent	83.2		%	1	04/11/22 16:24	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	9730	120	mg/kg	1	04/11/22 18:21	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_25-30_20220406	<b>Date Sampled:</b>	04/06/22
<b>Lab Sample ID:</b>	JD42497-26A	<b>Date Received:</b>	04/06/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	82.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	951	51	mg/kg	1	04/08/22 18:13	DB	SM5210 B-11 M
Chemical Oxygen Demand	15200	2400	mg/kg	1	04/11/22 14:38	MP	SM5220C11M,HACH8000M
Solids, Percent	82.9		%	1	04/11/22 16:24	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	10400	120	mg/kg	1	04/11/22 19:26	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Certification Exceptions
- Chain of Custody



Parameter Certification Exceptions

Job Number: JD42497A  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
% Gravel		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
% Sand		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
% Silt, Clay, Colloids		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
BOD, 5 Day		SM5210 B-11 M	SO	SGS is not certified for this parameter. <sup>a</sup>

(a) Lab cert for analyte not supported by NJDEP, OQA. Only methods/analytes required for reporting by the State of NJ can be certified in NJ. Use of this analyte for compliance must be verified through the appropriate regulatory office.

Certification exceptions shown are based on the New Jersey DEP certifications. Applicability in other states may vary. Please contact your laboratory representative if additional information is required for a specific regulatory program.

[illegible]

## JD42497A: Chain of Custody


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Please merge with SDG:

[illegible]

## JD42497A: Chain of Custody

Page 2 of 10



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 3 of 4  
 JD 42497

Please merge with SDG:


Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		FED-EX Tracking # SGS Quote # 2022 844		Bottle Order Control # SGS Job #	
Street Address 1015 Virginia Dr, Suite 100 City State Zip Fort Washington, PA, 19034		Street 100 Green Street City State Marcus Hook, PA 19061		Billing Information (if different from Report to) Company Name Sanborn Head & Associates		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED- Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank	
Project Contact Shana Whitney swhitney@sanbornhead.com		Project # 4862.04		Street Address 20 Foundry Street		City State Zip Concord, NH, 03301	
Phone # 603-415-6159		Client Purchase Order #		City State Zip Concord, NH, 03301		Accounts Payable Chelsey Shepsko (cshepsko@sanbornhead.com)	
Sample(s) Name(s) MECH/DOI Vial #		Project Manager Chelsey Shepsko		Number of preserved bottles		LAB USE ONLY	
Lab Sample #	Field ID / Point of Collection	Date	Time	Sampled by	Matrix	# of bottles	<input type="checkbox"/> DW <input type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> SO <input type="checkbox"/> SL <input type="checkbox"/> SED <input type="checkbox"/> OI <input type="checkbox"/> LIQ <input type="checkbox"/> AIR <input type="checkbox"/> SOL <input type="checkbox"/> WP <input type="checkbox"/> FB <input type="checkbox"/> EB <input type="checkbox"/> RB <input type="checkbox"/> TB
13	AO17-BH-22-001 20-25 20220409	4/19/22	1510	URT	SO	1	X
14	AO17-BH-22-001 25-30 20220409	4/19/22	1520	URT	SO	1	X
15	MW-6092-35-40-20220405	4/18/22	1140	URT	SO	1	X
Turnaround Time (Business days) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink							
Approved by (SGS Project Manager)/Date: _____				Data Deliverable Information Commercial "A" (Level 1) Commercial "B" (Level 2) FULLT1 (Level 3+4) NJ Reduced x REDT1 x EDD Format SHA EquiS; Stentec EquiS Commercial "C" NJ Date of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data			
Sample Custody must be documented below each time samples change possession, including courier delivery.							
Date Time 4/13/22 1510	Received By: 1	Date Time 4/13/22 16:31	Received By: 2	Date Time 4/13/22 16:31	Received By: 4	Date Time 4/13/22 16:31	Received By: 4
Relinquished by: 3	Date Time 4/13/22 16:31	Relinquished by: 4	Date Time 4/13/22 16:31	Relinquished by: 4	Date Time 4/13/22 16:31	Relinquished by: 4	Date Time 4/13/22 16:31
Intact Not Intact Preserved where applicable On Ice On Ice Cooler Temp							

JD42497A: Chain of Custody

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## 4.2

## 4.2



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX 732-329-3499

Page 2 of 4  
 Please merge with SDG: **JD2497**

Project Name: **Evergreen Marcus Hook**  
 Street Address: **1015 Virginia Dr, Suite 100**  
 City: **Fort Washington** State: **PA** Zip: **19074**  
 Project Contact: **Shana Whitney** Email: **swhitney@sanbornhead.com**  
 Phone #: **603-415-6159**  
 Sampler(s) Name(s): \_\_\_\_\_ Phone #: \_\_\_\_\_

Billing Information (If different from Report to)  
 Company Name: **Sanborn Head & Associates**  
 Street Address: **20 Foundry Street**  
 City: **Concord, NH** State: **03301** Zip: \_\_\_\_\_  
 Project #: **4862 04**  
 Client Purchase Order #: \_\_\_\_\_  
 Project Manager: **Chelsey Shepsko**  
 Chelsey Shepsko (cshepsko@sanbornhead.com)

Lab Sample #	Field ID / Point of Collection	MEOH/CI Vial #	Collection		Sampled by	Matrix	# of bottles	Number of preserved bottles										Total Arsenic and Iron by USF PA 6010	Matrix Codes
			Date	Time				NO	NOH	PCOH	NOH	NOH	NOH	NOH	NOH	NOH	NOH		
24	MW-608D 15-20 20220406		4/6/22	0850	LRT	SO	1												
25	MW-608D 20-25 20220406		4/6/22	0855	LRT	SO	1												
26	MW-608D 25-30 20220406		4/6/22	0900	LRT	SO	1												
27	MW-608D 30-35 20220406		4/6/22	0905	LRT	SO	1												
	MW-609D 0-5 202204					SO													
	MW-609D 5-10 202204					SO													
	MW-609D 10-15 202204					SO													
	MW-609D 15-20 202204					SO													
	MW-609D 20-25 202204					SO													
	MW-609D 25-30 202204					SO													
	MW-609D 30-35 202204					SO													
	AO17-BH-22-001 0-5 202204					SO													
	AO17-BH-22-001 5-10 202204					SO													
	AO17-BH-22-001 10-15 202204					SO													
	AO17-BH-22-001 15-20 202204					SO													

☒ Std. 10 Business Days  
☐ 5 Day RUSH  
☐ 3 Day RUSH  
☐ 2 Day RUSH  
☐ 1 Day RUSH  
☐ other \_\_\_\_\_  
Emergency & Rush TIA data available via LabLink

Approved by (SGS Project Manager)/Date: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Deliverable Information  
 Commercial "A" (Level 1)  
 Commercial "B" (Level 2)  
 FULLY (Level 3+4)  
 NJ Reduced  
 x REDT1 x EDO Format SHA EquiS; Stantec EquiS  
 Commercial "C"  
 NJ Data of Known Quality Protocol Reporting  
 Commercial "A" = Results Only, Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

Requisitioned By: **[Signature]**  
 Date Time: **4/6 1430**

Recalled By: **[Signature]**  
 Date Time: **4/6 1430**

Requisitioned By: **[Signature]**  
 Date Time: **4/6 1430**

Recalled By: **[Signature]**  
 Date Time: **4/6 1430**

Requisitioned By: **[Signature]**  
 Date Time: **4/6 1430**

Recalled By: **[Signature]**  
 Date Time: **4/6 1430**

JD2497A: Chain of Custody

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<b>Company Name</b> Sanborn Head & Associates		<b>Project Name</b> Evergreen Marcus Hook		<b>Street Address</b> 1015 Virginia Rd, Suite 100 City: _____ State: _____ Zip: _____ For Washington, PA. 19034		<b>Street</b> 106 Green Street <b>Billing information (if different from Report to)</b> Company Name: <u>Sanborn Head &amp; Associates</u> Street Address: <u>20 Foundry Street</u> City: _____ State: _____ Zip: _____		<b>Project #</b> 4862 04		<b>Client Purchase Order #</b> _____		<b>City</b> Concord, NH, 03301		<b>State</b> _____		<b>Zip</b> _____		<b>Project Contact</b> Shana Whitney <u>shwhitney@sanbornhead.com</u>		<b>Phone #</b> 603-415-6159		<b>Accounts Payable:</b> <u>Chelsey Shepsko (cshepsko@sanbornhead.com)</u>		<b>LAB USE ONLY</b> DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Slurw SFD Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid W/P Wipe FB-Field Blank EB- Equipment Blank RB-Rinse Blank TB- Trip Blank	
<b>Lab Sample #</b> _____		<b>Field ID / Point of Collection</b> _____		<b>MECH/ID Vial #</b> _____		<b>Date</b> _____		<b>Time</b> _____		<b>Sampled by</b> _____		<b>Matrix</b> _____		<b># of bottles</b> _____		<b>Number of preserved bottles</b> H2O HNO3 H2SO4 HCl H2O2 DI Water MECH MECH/EQ BNCORE		<b>COD by 5220 BOD by 5210 TOC by Lloyd</b> _____		<b>Kahn</b> _____		<b>Grain Size by ASTM D422</b> _____		<b>Alterberg Limits by D4318</b> _____	
MW-539D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-550D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-559D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-560D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-560D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-560D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-608D 10-15 202204		_____		_____		4/6/22		0845		LKT		SO		1		_____		_____		_____		_____			
MW-608D 7-15 202204		_____		_____		4/6/22		1855		LKT		SO		1		_____		_____		_____		_____			
MW-608D 7-31 202204		_____		_____		4/6/22		0900		LKT		SO		2		_____		_____		_____		_____			
MW-609D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-609D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
MW-609D 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
AQ17-BH-22-001 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
AQ17-BH-22-001 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
AQ17-BH-22-001 202204		_____		_____		_____		_____		_____		SO		1		_____		_____		_____		_____			
<b>Turnaround Time (Business days)</b> _____		<b>Approved by (SGS Project Manager):</b> _____		<b>Commercial "A" (Level 1)</b> Commercial "B" (Level 2) X FULLT1 (Level 3+4) NJ Reduced _____ Commercial "C" _____ NJ Date of Known Quality Protocol Reporting _____ Commercial "X" = Results Only Commercial "S" = Results + QC Summary																					

## JD42497A: Chain of Custody

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## SGS Sample Receipt Summary

**Job Number:** JD42497

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 4/5/2022 4:51:00 PM

**Delivery Method:** \_\_\_\_\_

**Airbill #s:** \_\_\_\_\_

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 1: (1.5);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s:      pH 1-12: 231619      pH 12+: 203117A      Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
Rev. Date 12/7/17

JD42497A: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: JD42497

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 4/6/2022 5:10:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 2: (3.1);

Cooler Temps (Corrected) °C: Cooler 2: (2.8);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD42497A: Chain of Custody

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## General Chemistry

5

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD42497A  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
BOD, 5 Day	GP39384/GN27947	50	<50	mg/kg	198	222	112.1	85-115%
BOD, 5 Day	GP39423/GN28003	21	<21	mg/kg	198	209	106.0	85-115%
Chemical Oxygen Demand	GP39420/GN28084	200	0.0	mg/kg				
Chemical Oxygen Demand	GP39420/GN28084	200	0.0	mg/kg	1500	1490	99.3	90-110%
Chemical Oxygen Demand	GP39420/GN28084			mg/kg	7500	7660	102.1	90-110%
Total Organic Carbon	GP39410/GN28115	100	0.00	mg/kg	2000	2030	101.5	80-120%

Associated Samples:

Batch GP39384: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21

Batch GP39410: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A

Batch GP39420: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A

Batch GP39423: JD42497-23A, JD42497-25A, JD42497-26A

(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD42497A  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
% Gravel	GP39462/GN28395	JD42689-1	%	19.6	20.1	-2.5	0-41%
% Sand	GP39462/GN28395	JD42689-1	%	68.5	69.5	-1.4	0-16%
% Silt, Clay, Colloids	GP39462/GN28395	JD42689-1	%	11.9	10.4	13.2	0-40%
0.005 mm (Hydrometer)	GP39462/GN28395	JD42689-1	%	2.6	2.6	0.0	0-48%
0.030 mm (Hydrometer)	GP39462/GN28395	JD42689-1	%	6.1	6.2	1.6	0-36%
0.375 Inch Sieve	GP39462/GN28395	JD42689-1	%	95.5	96.1	-0.6	0-14%
0.75 Inch Sieve	GP39462/GN28395	JD42689-1	%	100	100	0.0	0-9%
1.5 Inch Sieve	GP39462/GN28395	JD42689-1	%	100	100	0.0	0-20%
3 Inch Sieve	GP39462/GN28395	JD42689-1	%	100	100	0.0	0-20%
BOD, 5 Day	GP39384/GN27947	JD42497-18	mg/kg	2990	2970	0.7	0-20%
BOD, 5 Day	GP39423/GN28003	JD42497-23A	mg/kg	1770	2080	16.1	0-20%
Chemical Oxygen Demand	GP39420/GN28084	JD42497-16	mg/kg	64200	64200	0.0	0-33%
No.10 Sieve (2.00 mm)	GP39462/GN28395	JD42689-1	%	60.3	59.1	2.1	0-14%
No.100 Sieve (0.15 mm)	GP39462/GN28395	JD42689-1	%	14.2	12.4	13.6	0-31%
No.16 Sieve (1.18 mm)	GP39462/GN28395	JD42689-1	%	50.4	51.7	-2.6	0-17%
No.200 Sieve (0.075 mm)	GP39462/GN28395	JD42689-1	%	11.9	10.4	13.2	0-40%
No.30 Sieve (0.60 mm)	GP39462/GN28395	JD42689-1	%	38.8	42.3	-8.6	0-21%
No.4 Sieve (4.75 mm)	GP39462/GN28395	JD42689-1	%	80.4	79.9	0.6	0-13%
No.50 Sieve (0.30 mm)	GP39462/GN28395	JD42689-1	%	25.1	27.9	-10.5	0-30%
No.8 Sieve (2.36 mm)	GP39462/GN28395	JD42689-1	%	62.5	61.9	0.9	0-14%
Solids, Percent	GN27930	JD42497-2	%	77.5	78.2	0.9	0-5%
Solids, Percent	GN27933	JD42492-19	%	53.3	55.6	4.2	0-5%
Solids, Percent	GN28081	JD42717-63	%	79.6	78.6	1.3	0-5%
Solids, Percent	GN28088	JD42804-1	%	94.4	94.3	0.1	0-5%

Associated Samples:

Batch GN27930: JD42497-16, JD42497-17, JD42497-18

Batch GN27933: JD42497-19, JD42497-20, JD42497-21

Batch GN28081: JD42497-23A

Batch GN28088: JD42497-25A, JD42497-26A

Batch GP39384: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21

Batch GP39420: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A

Batch GP39423: JD42497-23A, JD42497-25A, JD42497-26A

Batch GP39462: JD42497-16A, JD42497-17A, JD42497-18A, JD42497-19A, JD42497-20A, JD42497-21A

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD42497A  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chemical Oxygen Demand	GP39420/GN28084	JD42497-16	mg/kg	64200	35000	96300	91.8	75-125%
Total Organic Carbon	GP39410/GN28115	JD42497-17	mg/kg	19200	22300	33700	65.1	14-161%
Total Organic Carbon	GP39410/GN28115	JD42497-25A	mg/kg	9730	23100	27700	77.9	14-161%

Associated Samples:

Batch GP39410: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A

Batch GP39420: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD42497A  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Total Organic Carbon	GP39410/GN28115	JD42497-17	mg/kg	19200	22900	39200	15.1	
Total Organic Carbon	GP39410/GN28115	JD42497-25A	mg/kg	9730	22600	30300	9.0	

Associated Samples:  
Batch GP39410: JD42497-16, JD42497-17, JD42497-18, JD42497-19, JD42497-20, JD42497-21, JD42497-23A, JD42497-25A, JD42497-26A  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits

5.4  
5



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD42497X

Sampling Dates: 04/05/22 - 04/06/22

### Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: **24**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink, appearing to read "Mike Earp".

Mike Earp  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.  
Test results relate only to samples analyzed.

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Section 2: Subcontract Lab Data .....

Section 3: Misc. Forms .....

3.1: Chain of Custody .....

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Sample Summary

Sunoco/Evergreen

Job No: JD42497X

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD42497-18X	04/05/22	11:30 LRT	04/05/22	SO	Soil	MW-609D_25-30_20220405
JD42497-26X	04/06/22	09:00 LRT	04/06/22	SO	Soil	MW-608D_25-30_20220406

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

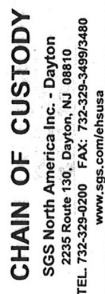


Dayton, NJ

Section 2

Subcontract Lab Data

Report of Analysis

Rev. Date: 4/10/18

Date / Time: 4/8/2022 8:50:03 AM

CSR: VICKYP

Job #: JD42497X

Client Project: SANHPAFW: Marcus Hook, PA

Deliverable: COMMB

TAT: 21

Sub Lab: Golder - Physical Testing  
Address: 3731 Northcrest Road, Suite 2

City: Atlanta

State: GA Zip: 30340

Contact: Henry Mock

Phone: (770) 492-8280

SGS Sample #	Client Sample Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
JD42497-26X	MW-608D_25-30_20220406	ATTERBERG		LRI	4/6/2022	9:00:00 AM	

Comments:

Sample Management Receipt:

Date: 4/17/22

[illegible]

Date / Time: 4/7/2022 7:59:19 AM

CSR: VICKYP

Job #: JD42497X

Client Project: SANHPAFW: Marcus Hook, PA

Deliverable: REDT2

TAT: 21

Sub Lab: Golder - Physical Testing

Address: 3731 Northcrest Road, Suite 2

City: Atlanta

State: GA

Zip: 30340

Contact: Henry Mock

Phone: (770) 492-8280

SGS Sample #	Client Sample Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
JD42497-18X	MW-609D 25-30 20220405	ATTERBERG		LRI	4/5/2022	11:30:00 AM	

Comments:

Sample Management Receipt:



Date:

4/20/22



		<b>Client / Reporting Information</b>		<b>Project Information</b>		<b>Matrix Codes</b>	
Company Name: SANHAPW: Marcus Hook, PA		Project Name: SANHAPW: Marcus Hook, PA		Billing Information (if different from Report to) Company Name Street City State Zip		Requested Analysis DW - Drinking Water GW - Ground Water WW - Wastewater SW - Surface Water SL - Sludge SED - Sediment LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EDO - Empty Blank TB - Trip Blank	
Street Address City State Zip		Project # Client Purchase Order #		Attention: Project Manager		Matrix Codes DW - Drinking Water GW - Ground Water WW - Wastewater SW - Surface Water SL - Sludge SED - Sediment LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EDO - Empty Blank TB - Trip Blank	
Phone # Project Manager		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Sample(s) Name(s) LRT		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-608D_25-30_20220406		Date 4/6/22		Time 9:00:00 AM		Number of preserved bottles ENDORE DI Water NONE H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl H <sub>2</sub> O <sub>2</sub>	
Field ID / Point of Collection MW-60							

Date / Time: 4/8/2022 8:50:03 AM

CSR: VICKYP

Job #: JD42497X

Client Project: SANHPAFW: Marcus Hook, PA

Deliverable: COMMB

TAT: 21

Sub Lab: Golder - Physical Testing

Address: 3731 Northcrest Road, Suite 2

City: Atlanta

State: GA

Zip: 30340

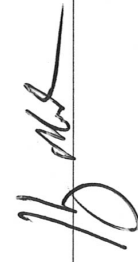
Contact: Henry Mock

Phone: (770) 492-8280

SGS Sample #	Client Sample Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
JD42497-26X	MW-608D_25-30_20220406	ATTERBERG...		LRI	4/6/2022	9:00:00 AM	

Comments:

Sample Management Receipt:



Date:

4/20/22

## SGS/SANHPFW- MARCUS HOOK/PA SUMMARY OF SOIL DATA

[illegible]

**ABBREVIATIONS:**

LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST  
U = UNCONFINED COMPRESSION TEST  
C = CONSOLIDATION TEST  
DS = DIRECT SHEAR TEST  
O = ORGANIC CONTENT  
P = pH

# ATTERBERG LIMITS

ASTM D 4318

PROJECT NAME: SGS/SANHPAFW- MARCUS HOOK/PA  
 PROJECT NUMBER: 31404670-001  
 SAMPLE ID: 18X  
 SAMPLE TYPE: Jar

## SAMPLE PREPARATION

Wet or Dry

Dry

Minus #40 Sieve

Yes

## PLASTIC LIMIT DETERMINATION

Number of Blows

Weight of Wet Soil & Tare (gm)	19.83	19.55
Weight of Dry Soil & Tare (gm)	18.12	17.87
Weight of Tare (gm)	11.80	11.42
Weight of Water (gm)	1.71	1.68
Weight of Dry Soil (gm)	6.32	6.45
Water Content %	27.06	26.05

## LIQUID LIMIT DETERMINATION

21	21
15.37	15.19
12.85	12.74
6.67	6.70
2.52	2.45
6.18	6.04
40.78	40.56

BLOWS:

21

21

K VALUE:

0.979

0.979

## NATURAL MOISTURE

129.32
102.24
52.09
27.08
50.15
54.00

PLASTIC LIMIT (PL)

27

LIQUID LIMIT (LL)

40

PLASTICITY INDEX (PI)

13

LIQUIDITY INDEX (LI)

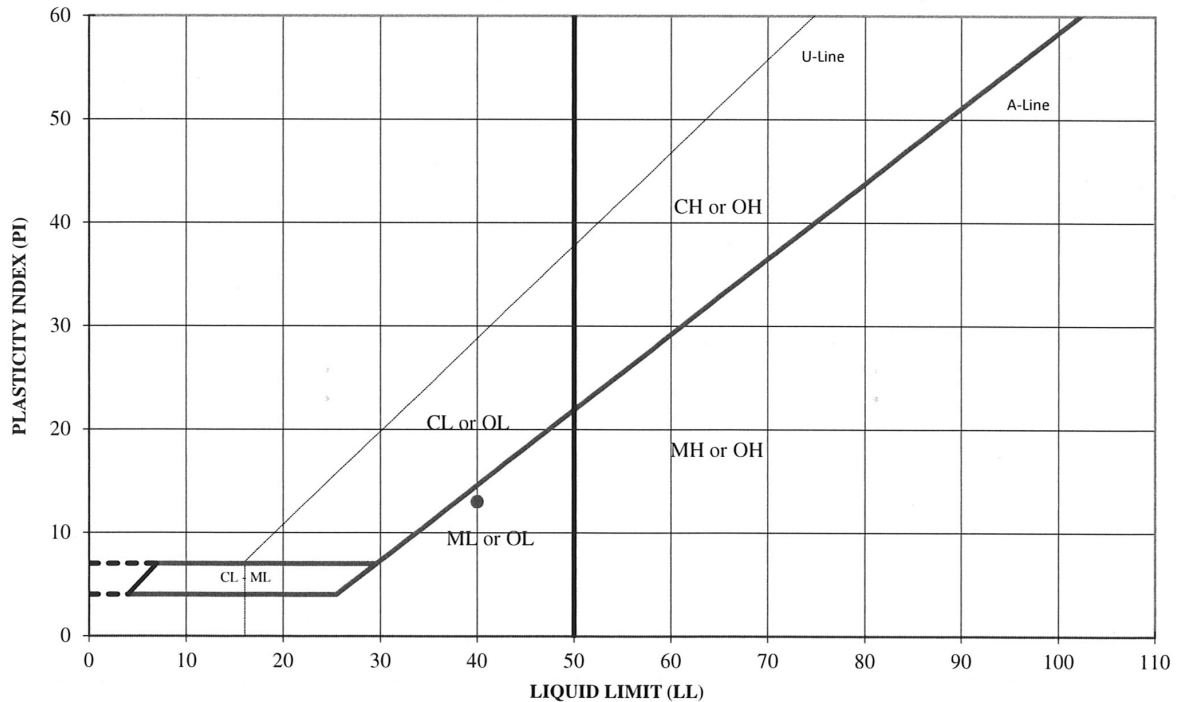
2.14

NOTE:

DESCRIPTION

USCS

## PLASTICITY CHART



TECH VB  
 DATE 4/20/22  
 CHECK  
 REVIEW  
 APPROVE

Golder Associates USA Inc.

# ATTERBERG LIMITS

ASTM D 4318

PROJECT NAME: SGS/SANHPAFW- MARCUS HOOK/PA  
PROJECT NUMBER: 31404670-001  
SAMPLE ID: 26X  
SAMPLE TYPE: Jar

SAMPLE DEPTH: -

## SAMPLE PREPARATION

Wet or Dry

Dry

Minus #40 Sieve

Yes

### PLASTIC LIMIT DETERMINATION

Number of Blows

Weight of Wet Soil & Tare (gm)	19.72	17.98
Weight of Dry Soil & Tare (gm)	18.13	16.64
Weight of Tare (gm)	11.81	11.39
Weight of Water (gm)	1.59	1.34
Weight of Dry Soil (gm)	6.32	5.25
Water Content %	25.16	25.52

### LIQUID LIMIT DETERMINATION

24	24
13.38	12.16
10.73	9.90
4.13	4.23
2.65	2.26
6.60	5.67
40.15	39.86

BLOWS:

24

24

K VALUE:

0.995

0.995

### NATURAL MOISTURE

68.01
63.15
51.61
4.86
11.54
42.11

PLASTIC LIMIT (PL)

25

LIQUID LIMIT (LL)

40

PLASTICITY INDEX (PI)

15

LIQUIDITY INDEX (LI)

1.13

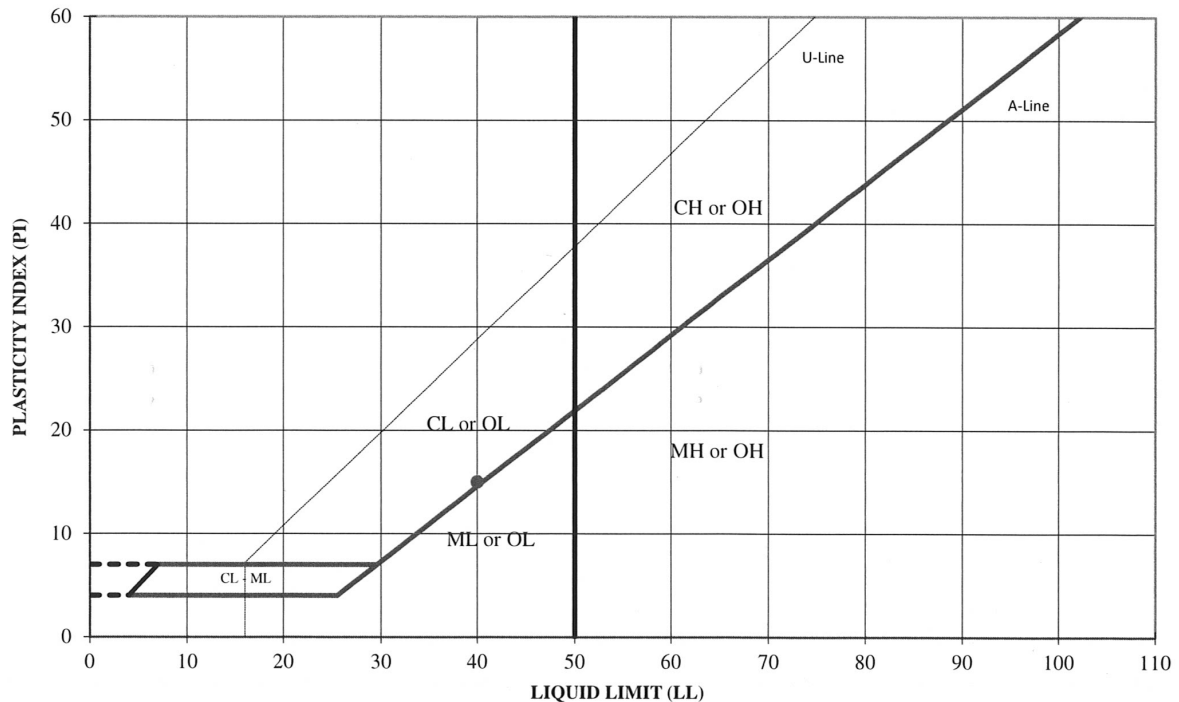
NOTE:

DESCRIPTION

USCS

-

## PLASTICITY CHART



TECH VB  
DATE 4/13/22  
CHECK  
REVIEW  
APPROVE

Golder Associates USA Inc.

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



SO

Page 1 of 4


JD 42497

JP-Q32222-361

SGS		CHAIN OF CUSTODY		SGS North America Inc. - Dayton		Please merge with SDG:		Bottle Order Control #	
2235 Route 130, Dayton, NJ 08810		TEL: 732-329-0200		FAX: 732-329-3499		SGS Quote # 2022 844		SGS Job #	
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook		Billing Information (if different from Report to)		Matrix Codes		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment Oil - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB-Rinse Blank TB- Trip Blank	
Street Address 1015 Virginia Dr, Suite 100		Street 100 Green Street		City Marcus Hook, PA 19061		City Concord, NH, 03301		State State	
City Fort Washington, PA, 19034		State PA		Zip 19061		State NH		Zip 03301	
Project Contact Shana Whitney		E-mail swhitney@sanbornhead.com		Project # 4862.04		Client Purchase Order #		Phone # 603-415-8159	
Phone # 603-415-8159		Fax #		Project Manager Chelsey Shepsko		Attention: Chelsey Shepsko (cshepsko@sanbornhead.com)		Accounts Payable: sp@sanbornhead.com	
Sample(s) Name(s)		Phone #		Collection		Number of preserved bottles		LAB USE ONLY	
Lab Sample #	Field ID / Point of Collection	MECHIDI Vial #	Date	Time	Sampled by	Matrix	# of bottles	CU	PA
	MW-550D 0-5-202204				SO				
	MW-550D 5-10-202204				SO				
	MW-550D 10-15-202204				SO				
	MW-550D 15-20-202204				SO				
	MW-550D 20-25-202204				SO				
	MW-550D 25-30-202204				SO				
	MW-560D 0-5-202204				SO				
	MW-560D 5-10-202204				SO				
	MW-560D 10-15-202204				SO				
	MW-560D 15-20-202204				SO				
	MW-560D 20-25-202204				SO				
	MW-560D 25-30-202204				SO				
	MW-608D 0-5-202204		4/11/22	1320	URT	SO	1		1
	MW-608D 5-10-202204				SO				
	MW-608D 10-15-202204				SO				
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:		Data Deliverable Information		Comments / Special Instructions			
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other				Commercial "A" (Level 1) Commercial "B" (Level 2) FULLT1 (Level 3+4) NJ Reduced x REDT1 x EDD Format SHA EquiS; Stantec EquiS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data					
Emergency & Rush T/A data available via LabLink									
Received by: 1		Date/Time: 4/13/22 15:10		Received by: 1		Date/Time: 4/13/22 16:51		Received by: 2	
Relinquished by Sampler: 3		Date/Time:		Relinquished by: 2		Date/Time:		Relinquished by: 4	
Relinquished by: 5		Date/Time:		Received By: 5		Custody Seal #		On Ice <input type="checkbox"/> Cooler Temp <input checked="" type="checkbox"/>	

JD42497X: Chain of Custody

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**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 2 of 4  
 Please merge with SDG:

JD42497

Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank												
Street Address <b>1015 Virginia Dr, Suite 100</b> City State Zip <b>Fort Washington, PA, 19034</b>		Street <b>100 Green Street</b> City State <b>Marcus Hook, PA 19061</b>		Billing Information (If different from Report to) Company Name <b>Sanborn Head &amp; Associates</b> Street Address <b>20 Foundry Street</b> City State Zip <b>Concord, NH, 03301</b>												
Project Contact Shana Whitney E-mail shawhitey@sanbornhead.com		Project # <b>4862.04</b>		Client Purchase Order # <b>4862.04</b>												
Phone # <b>603-415-6159</b>		Project Manager <b>Chelsey Shepsko</b>		Accounts Payable Chelsey Shepsko (cshepsko@sanbornhead.com)												
Sampler(s) Name(s) <b>Shana Whitney</b>		Phone # <b>603-415-6159</b>		Number of preserved bottles Matrix # of bottles Q NaOH HNO3 H2SO4 HClO4 NONE In Water MEQ/100L MEQ/1000L												
Lab Sample #	Field ID / Point of Collection	MEQ/100L Vial #	Date	Time	Sampled by	Matrix	# of bottles	Q	NaOH	HNO3	H2SO4	HClO4	NONE	In Water	MEQ/100L	MEQ/1000L
1	MW-608D 13-20 202204					SO	1									X
2	MW-608D 20-25 202204					SO	1									X
3	MW-608D 25-30 202204					SO	1									X
4	MW-608D 30-35 202204					SO	1									X
5	MW-609D 0-5 20220404		9/4/2022	1315	ERT	SO	1									X
6	MW-609D 5-10 20220405		9/5/22	1100	ERT	SO	1									X
7	MW-609D 10-15 20220405		9/5/22	1110	ERT	SO	1									X
8	MW-609D 15-20 20220405		9/5/22	1120	ERT	SO	1									X
9	MW-609D 20-25 20220405		9/5/22	1125	ERT	SO	1									X
10	MW-609D 25-30 20220405		9/5/22	1130	ERT	SO	1									X
11	MW-609D 30-35 20220405		9/5/22	1135	ERT	SO	1									X
12	AO17-B11-22-001 0-5 20220404		9/4/22	1425	ERT	SO	4									X
13	AO17-B11-22-001 5-10 20220404		9/4/22	1450	ERT	SO	1									X
14	AO17-B11-22-001 10-15 20220404		9/4/22	1505	ERT	SO	1									X
15	AO17-B11-22-001 15-20 20220404		9/4/22	1500	ERT	SO	1									X

☒ Std. 10 Business Days  
☐ 5 Day RUSH  
☐ 3 Day RUSH  
☐ 2 Day RUSH  
☐ 1 Day RUSH  
☐ other  
 Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Deliverable Information  
 Commercial "A" (Level 1) NYASP Category A  
 Commercial "B" (Level 2) NYASP Category B  
 FULLT1 (Level 3+4) State Forms  
 NJ Reduced  
 x REDT1 x EDD Format SHA EquiS; Stantec EquiS  
 Commercial "C"  
 NJ Date of Known Quality Protocol Reporting  
 Commercial "A" = Results Only Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

Sample Custody must be documented below each time samples change possession, including courier delivery.					
Received By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 1510</u>	Received By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 16:51</u>	Received By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 16:51</u>
Relinquished By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 1510</u>	Relinquished By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 16:51</u>	Relinquished By: <u>Shana Whitney</u>	Date/Time: <u>9/5/22 16:51</u>
Custody Seal # <u>3</u>	Intact Not <input type="checkbox"/> <input checked="" type="checkbox"/>	Custody Seal # <u>4</u>	Intact Not <input type="checkbox"/> <input checked="" type="checkbox"/>	Custody Seal # <u>5</u>	Intact Not <input type="checkbox"/> <input checked="" type="checkbox"/>





## CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX 732-329-3499

Page 4 of 4 JD 42497

Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		FED-EX Tracking # _____		Bottle Order Control # _____	
Street Address <b>1015 Virginia Dr, Suite 100</b>		Street <b>100 Green Street</b>		Billing Information (If different from Report to) Company Name <b>Sanborn Head &amp; Associates</b>		SGS Quote # 2022 644	
City State Zip <b>Fort Washington, PA, 19034</b>		City State <b>Marcus Hook, PA 19061</b>		Street Address <b>20 Foundry Street</b>		SGS Job # _____	
Project Contact <b>Shana Whitney</b> E-mail <b>swhitney@sanbornhead.com</b>		Project # <b>4862 04</b>		City State Zip <b>Concord, NH, 03301</b>		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment Oil - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank	
Phone # <b>603-415-6159</b>		Client Purchase Order # <b>Chelsey Shepsko</b>		Accounts Payable: <b>Chelsey Shepsko (cshepsko@sanbornhead.com)</b>		COD by 5220 BOD by 5210 TOC by Liquid Grain Size by ASTM D422 Alterberg Limits by D4318	
Sampler(s) Name(s) <b>Chelsey Shepsko</b>		Project Manager <b>Chelsey Shepsko</b>		Number of preserved bottles SO _____ GW _____ WW _____ SW _____ SO _____ SL _____ SED _____ LIQ _____ AIR _____ SOL _____ WP _____ Wipe _____ FB _____ EB _____ RB _____ TB _____		LAB USE ONLY	

Lab Sample #	Field ID / Point of Collection	MEOHDI Vial #	Collection		Sampled by	Matrix	# of bottles	Number of preserved bottles										Kalm	Grain Size by ASTM D422	Alterberg Limits by D4318	LAB USE ONLY
			Date	Time				SO	GW	WW	SW	SO	SL	SED	LIQ	AIR	SOL				
16	MW-539D 202204					SO															
17	MW-550D 202204					SO															
18	MW-560D 202204					SO															
19	MW-560D 202204					SO															
20	MW-560D 202204					SO															
21	MW-560D 202204					SO															
22	MW-560D 202204					SO															
23	MW-560D 202204					SO															
24	MW-560D 202204					SO															
25	MW-560D 202204					SO															
26	MW-560D 202204					SO															
27	MW-560D 202204					SO															
28	MW-560D 202204					SO															
29	MW-560D 202204					SO															
30	MW-560D 202204					SO															
31	MW-560D 202204					SO															
32	MW-560D 202204					SO															
33	MW-560D 202204					SO															
34	MW-560D 202204					SO															
35	MW-560D 202204					SO															
36	MW-560D 202204					SO															
37	MW-560D 202204					SO															
38	MW-560D 202204					SO															
39	MW-560D 202204					SO															
40	MW-560D 202204					SO															
41	MW-560D 202204					SO															
42	MW-560D 202204					SO															
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100	MW-560D 202204					SO															

☒ Std. 10 Business Days  
☐ 5 Day RUSH  
☐ 3 Day RUSH  
☐ 2 Day RUSH  
☐ 1 Day RUSH  
☐ other \_\_\_\_\_  
Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Deliverable Information  
 Commercial "A" (Level 1) \_\_\_\_\_  
 Commercial "B" (Level 2) \_\_\_\_\_  
 FULLT1 (Level 3+4) \_\_\_\_\_  
 NJ Reduced \_\_\_\_\_  
 Commercial "C" \_\_\_\_\_  
 NJ Data of Known Quality Protocol Reporting  
 Commercial "A" = Results Only    Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sample Custody must be documented below each time samples change possession, including courier delivery.	
Relinquished By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b> Relinquished By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b>	Received By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b> Received By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b>
Relinquished By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b>	Received By: <b>[Signature]</b> Date: <b>4/15/22 15:10</b>

3.1 3





		<b>CHAIN OF CUSTODY</b> SGS North America Inc. - Dayton 2235 Route 130, Dayton, NJ 08810 TEL 732-329-0200 FAX 732-329-3499		Page <b>1</b> of <b>4</b> <b>JD42497</b>															
		FED-EX Tracking # _____ SGS Quote # 2022 644 _____		Order Control # _____ SGS Job # _____															
Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Matrix Codes</th> </tr> <tr><td>DW - Drinking Water</td></tr> <tr><td>GW - Ground Water</td></tr> <tr><td>WW - Water</td></tr> <tr><td>SW - Surface Water</td></tr> <tr><td>SO - Soil</td></tr> <tr><td>SL - Sludge/Sediment</td></tr> <tr><td>LIQ - Other Liquid Air</td></tr> <tr><td>  Air</td></tr> <tr><td>SOL - Other Solid Waste</td></tr> <tr><td>  Wipe</td></tr> <tr><td>FB-Field Blank EB- Equipment Blank</td></tr> <tr><td>RB- Rinse Blank TB- Trip Blank</td></tr> </table>		Matrix Codes		DW - Drinking Water	GW - Ground Water	WW - Water	SW - Surface Water	SO - Soil	SL - Sludge/Sediment	LIQ - Other Liquid Air	Air	SOL - Other Solid Waste	Wipe	FB-Field Blank EB- Equipment Blank	RB- Rinse Blank TB- Trip Blank
Matrix Codes																			
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LIQ - Other Liquid Air																			
Air																			
SOL - Other Solid Waste																			
Wipe																			
FB-Field Blank EB- Equipment Blank																			
RB- Rinse Blank TB- Trip Blank																			
Street Address <b>1015 Virginia Dr, Suite 100</b>		Street <b>100 Green Street</b>																	
City State Zip <b>Fort Washington, PA 19034</b>		City State <b>Marcus Hook, PA 19061</b>																	
Project Contact Shana Whitney swhitney@sanbornhead.com		Project # <b>4862 04</b>																	
Phone # <b>603-415-6159</b>		Client Purchase Order # _____																	
Sampler(s) Name(s) _____ Phone # _____		Project Manager <b>Chelsey Shepsko</b>		Billing Information (if different from Report to) Company Name <b>Sanborn Head &amp; Associates</b> Street Address <b>20 Foundry Street</b> City State Zip <b>Concord, NH, 03301</b> Accounts Payable: (Chelsey Shepsko cshepsko@sanbornhead.com) ap@sanbornhead.com															
Lab Sample # _____		Date Time _____		# of bottles _____															
Field ID / Point of Collection <b>MEOH/DI Vial #</b>		Sampled by _____		Matrix _____															
MW-339D 202204 _____		SO _____		X _____															
MW-550D 202204 _____		SO _____		X _____															
MW-560D 202204 _____		SO _____		X _____															
MW-560D 202204 _____		SO _____		X _____															
MW-560D 202204 _____		SO _____		X _____															
MW-560D 202204 _____		SO _____		X _____															
MW-608D 11/15 202204/06 _____		SO 1 _____		X _____															
MW-608D 11/15 202204/06 _____		SO 1 _____		X _____															
MW-608D 11/31 202204/06 _____		SO 2 _____		X _____															
MW-609D 202204 _____		SO _____		X _____															
MW-609D 202204 _____		SO _____		X _____															
MW-609D 202204 _____		SO _____		X _____															
AQ17-BH-22-001 202204 _____		SO _____		X _____															
AQ17-BH-22-001 202204 _____		SO _____		X _____															
AQ17-BH-22-001 202204 _____		SO _____		X _____															
AQ17-BH-22-001 202204 _____		SO _____		X _____															
Turnaround Time (Business days) _____		Data Deliverable Information _____		Comments / Special Instructions _____															
X Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		Approved by (SGS Project Manager): _____ _____ _____ _____		Commercial "A" (Level 1) _____ NYASP Category A Commercial "B" (Level 2) X _____ NYASP Category B FULLT1 (Level 3/4) _____ State Forms NJ Reduced _____ x EDD Format SHA & Stantec EQUIS _____ Commercial "C" _____ Other _____ NJ Data of Known Quality Protocol Reporting Commercial "X" = Results Only, Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data															
Emergency & Rush TIA data available via LabLink		Sample Custody must be documented below each time samples change possession, including courier delivery.		Date Time _____ Date Time _____ Date Time _____ Date Time _____															
Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____															
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Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____		Relinquished by: _____ Date Time: _____															
Relinquished by: _____ Date Time																			

## JD42497X: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: JD42497

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 4/5/2022 4:51:00 PM

Delivery Method: \_\_\_\_\_

Airbill #s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (3.1);

Cooler Temps (Corrected) °C: Cooler 1: (1.5);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
Rev. Date 12/7/17

JD42497X: Chain of Custody

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## SGS Sample Receipt Summary

**Job Number:** JD42497

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 4/6/2022 5:10:00 PM

**Delivery Method:** \_\_\_\_\_

**Airbill #s:** \_\_\_\_\_

**Cooler Temps (Raw Measured) °C:** Cooler 2: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 2: (2.8);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

**JD42497X: Chain of Custody**

**Page 10 of 10**



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD44647

Sampling Date: 05/11/22

### Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 25



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink, appearing to read "D. Chastain".

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.  
Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD44647

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD44647-1	05/11/22	13:25	CSS	05/11/22	SO Soil	MW-559D_0-10_20220511
JD44647-2	05/11/22	13:35	CSS	05/11/22	SO Soil	MW-559D_10-20_20220511
JD44647-3	05/11/22	13:45	CSS	05/11/22	SO Soil	MW-559D_20-30_20220511
JD44647-4	05/11/22	09:30	CSS	05/11/22	SO Soil	MW-560D_0-10_20220511
JD44647-4A	05/11/22	09:30	CSS	05/11/22	SO Soil	MW-560D_0-10_20220511
JD44647-5	05/11/22	09:40	CSS	05/11/22	SO Soil	MW-560D_10-20_20220511
JD44647-5A	05/11/22	09:40	CSS	05/11/22	SO Soil	MW-560D_10-20_20220511
JD44647-6	05/11/22	09:50	CSS	05/11/22	SO Soil	MW-560D_20-30_20220511
JD44647-6A	05/11/22	09:50	CSS	05/11/22	SO Soil	MW-560D_20-30_20220511

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

Page 1 of 3

**Job Number:** JD44647  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/11/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

### JD44647-1 MW-559D\_0-10\_20220511

BOD, 5 Day	700	52		mg/kg	SM5210 B-11 M
Total Organic Carbon	31000	120		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-2 MW-559D\_10-20\_20220511

BOD, 5 Day	97.6	50		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	134	120		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	595	120		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-3 MW-559D\_20-30\_20220511

BOD, 5 Day	897	65		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	275	150		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	23500	150		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-4 MW-560D\_0-10\_20220511

BOD, 5 Day <sup>a</sup>	458	54		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	201	130		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	37100	130		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-4A MW-560D\_0-10\_20220511

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	89.8		%	ASTM D422-63
0.375 Inch Sieve	84.5		%	ASTM D422-63
No.4 Sieve (4.75 mm)	72.8		%	ASTM D422-63
No.8 Sieve (2.36 mm)	61.3		%	ASTM D422-63
No.10 Sieve (2.00 mm)	59.5		%	ASTM D422-63
No.16 Sieve (1.18 mm)	54.7		%	ASTM D422-63
No.30 Sieve (0.60 mm)	48.4		%	ASTM D422-63
No.50 Sieve (0.30 mm)	42.3		%	ASTM D422-63
No.100 Sieve (0.15 mm)	32.2		%	ASTM D422-63
No.200 Sieve (0.075 mm)	26.6		%	ASTM D422-63
0.030 mm (Hydrometer)	14		%	ASTM D422-63
0.005 mm (Hydrometer)	7.0		%	ASTM D422-63
0.0015 mm (Hydrometer)	6.0		%	ASTM D422-63
% Gravel	27.2		%	ASTM D422-63
% Sand	46.2		%	ASTM D422-63
% Silt, Clay, Colloids	26.6		%	ASTM D422-63

## Summary of Hits

**Job Number:** JD44647  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/11/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD44647-5 MW-560D\_10-20\_20220511

BOD, 5 Day	1450	64		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	374	150		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	50000	150		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-5A MW-560D\_10-20\_20220511

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	100		%	ASTM D422-63
0.375 Inch Sieve	99.8		%	ASTM D422-63
No.4 Sieve (4.75 mm)	96.3		%	ASTM D422-63
No.8 Sieve (2.36 mm)	88.0		%	ASTM D422-63
No.10 Sieve (2.00 mm)	86.1		%	ASTM D422-63
No.16 Sieve (1.18 mm)	81.8		%	ASTM D422-63
No.30 Sieve (0.60 mm)	75.5		%	ASTM D422-63
No.50 Sieve (0.30 mm)	67.9		%	ASTM D422-63
No.100 Sieve (0.15 mm)	44.4		%	ASTM D422-63
No.200 Sieve (0.075 mm)	37.1		%	ASTM D422-63
0.030 mm (Hydrometer)	26		%	ASTM D422-63
0.005 mm (Hydrometer)	12		%	ASTM D422-63
0.0015 mm (Hydrometer)	12		%	ASTM D422-63
% Gravel	3.7		%	ASTM D422-63
% Sand	59.2		%	ASTM D422-63
% Silt, Clay, Colloids	37.1		%	ASTM D422-63

### JD44647-6 MW-560D\_20-30\_20220511

BOD, 5 Day	875	66		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	522	160		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	34200	160		mg/kg	LLOYD KAHN 1988 MOD

### JD44647-6A MW-560D\_20-30\_20220511

3 Inch Sieve	100		%	ASTM D422-63
1.5 Inch Sieve	100		%	ASTM D422-63
0.75 Inch Sieve	100		%	ASTM D422-63
0.375 Inch Sieve	100		%	ASTM D422-63
No.4 Sieve (4.75 mm)	100		%	ASTM D422-63
No.8 Sieve (2.36 mm)	100		%	ASTM D422-63
No.10 Sieve (2.00 mm)	100		%	ASTM D422-63
No.16 Sieve (1.18 mm)	99.1		%	ASTM D422-63
No.30 Sieve (0.60 mm)	93.7		%	ASTM D422-63
No.50 Sieve (0.30 mm)	91.2		%	ASTM D422-63

Summary of Hits

**Job Number:** JD44647  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/11/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						
No.100 Sieve (0.15 mm)		89.3			%	ASTM D422-63
No.200 Sieve (0.075 mm)		86.6			%	ASTM D422-63
0.030 mm (Hydrometer)		74			%	ASTM D422-63
0.005 mm (Hydrometer)		26			%	ASTM D422-63
% Sand		13.4			%	ASTM D422-63
% Silt, Clay, Colloids		86.6			%	ASTM D422-63

(a) Sample set up with 3 separate dilutions, but DO difference is less than 2 on all of the dilutions. Results reported are from the lowest dilution.

## Sample Results

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## Report of Analysis

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Report of Analysis

<b>Client Sample ID:</b>	MW-559D_0-10_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-1	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day	700	52	mg/kg	1	05/12/22 18:16	DB	SM5210 B-11 M
Chemical Oxygen Demand	< 120	120	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	80.2		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	31000	120	mg/kg	1	05/19/22 11:02	MB	LLOYD KAHN 1988 MOD

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-559D_10-20_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-2	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	83.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day	97.6	50	mg/kg	1	05/12/22 16:20	DB	SM5210 B-11 M
Chemical Oxygen Demand	134	120	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	83.2		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	595	120	mg/kg	1	05/18/22 17:54	MB	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_20-30_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-3	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.6
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day	897	65	mg/kg	1	05/12/22 18:21	DB	SM5210 B-11 M
Chemical Oxygen Demand	275	150	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	64.6		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	23500	150	mg/kg	1	05/18/22 19:13	MB	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_0-10_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-4	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	458	54	mg/kg	1	05/12/22 18:22	DB	SM5210 B-11 M
Chemical Oxygen Demand	201	130	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	77.3		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	37100	130	mg/kg	1	05/19/22 11:23	MB	LLOYD KAHN 1988 MOD

(a) Sample set up with 3 separate dilutions, but DO difference is less than 2 on all of the dilutions. Results reported are from the lowest dilution.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_0-10_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-4A	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Particle Size Analysis (Sieve and Hydrometer Testing)							
3 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
0.75 Inch Sieve	89.8		%	1	06/11/22 23:22	DB	ASTM D422-63
0.375 Inch Sieve	84.5		%	1	06/11/22 23:22	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	72.8		%	1	06/11/22 23:22	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	61.3		%	1	06/11/22 23:22	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	59.5		%	1	06/11/22 23:22	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	54.7		%	1	06/11/22 23:22	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	48.4		%	1	06/11/22 23:22	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	42.3		%	1	06/11/22 23:22	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	32.2		%	1	06/11/22 23:22	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	26.6		%	1	06/11/22 23:22	DB	ASTM D422-63
0.030 mm (Hydrometer)	14		%	1	06/11/22 23:22	DB	ASTM D422-63
0.005 mm (Hydrometer)	7.0		%	1	06/11/22 23:22	DB	ASTM D422-63
0.0015 mm (Hydrometer)	6.0		%	1	06/11/22 23:22	DB	ASTM D422-63
% Gravel	27.2		%	1	06/11/22 23:22	DB	ASTM D422-63
% Sand	46.2		%	1	06/11/22 23:22	DB	ASTM D422-63
% Silt, Clay, Colloids	26.6		%	1	06/11/22 23:22	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_10-20_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-5	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	65.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day	1450	64	mg/kg	1	05/12/22 18:24	DB	SM5210 B-11 M
Chemical Oxygen Demand	374	150	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	65.4		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	50000	150	mg/kg	1	05/19/22 11:44	MB	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_10-20_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-5A	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	65.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Particle Size Analysis (Sieve and Hydrometer Testing)							
3 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
0.375 Inch Sieve	99.8		%	1	06/11/22 23:22	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	96.3		%	1	06/11/22 23:22	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	88.0		%	1	06/11/22 23:22	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	86.1		%	1	06/11/22 23:22	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	81.8		%	1	06/11/22 23:22	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	75.5		%	1	06/11/22 23:22	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	67.9		%	1	06/11/22 23:22	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	44.4		%	1	06/11/22 23:22	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	37.1		%	1	06/11/22 23:22	DB	ASTM D422-63
0.030 mm (Hydrometer)	26		%	1	06/11/22 23:22	DB	ASTM D422-63
0.005 mm (Hydrometer)	12		%	1	06/11/22 23:22	DB	ASTM D422-63
0.0015 mm (Hydrometer)	12		%	1	06/11/22 23:22	DB	ASTM D422-63
% Gravel	3.7		%	1	06/11/22 23:22	DB	ASTM D422-63
% Sand	59.2		%	1	06/11/22 23:22	DB	ASTM D422-63
% Silt, Clay, Colloids	37.1		%	1	06/11/22 23:22	DB	ASTM D422-63

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20-30_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-6	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	63.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day	875	66	mg/kg	1	05/12/22 18:27	DB	SM5210 B-11 M
Chemical Oxygen Demand	522	160	mg/kg	1	05/15/22 13:05	MK	SM5220C11M,HACH8000M
Solids, Percent	63.8		%	1	05/12/22 15:58	BG	SM2540 G 18TH ED MOD
Total Organic Carbon	34200	160	mg/kg	1	05/18/22 20:14	MB	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20-30_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44647-6A	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	63.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Particle Size Analysis (Sieve and Hydrometer Testing)							
3 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
1.5 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
0.75 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
0.375 Inch Sieve	100		%	1	06/11/22 23:22	DB	ASTM D422-63
No.4 Sieve (4.75 mm)	100		%	1	06/11/22 23:22	DB	ASTM D422-63
No.8 Sieve (2.36 mm)	100		%	1	06/11/22 23:22	DB	ASTM D422-63
No.10 Sieve (2.00 mm)	100		%	1	06/11/22 23:22	DB	ASTM D422-63
No.16 Sieve (1.18 mm)	99.1		%	1	06/11/22 23:22	DB	ASTM D422-63
No.30 Sieve (0.60 mm)	93.7		%	1	06/11/22 23:22	DB	ASTM D422-63
No.50 Sieve (0.30 mm)	91.2		%	1	06/11/22 23:22	DB	ASTM D422-63
No.100 Sieve (0.15 mm)	89.3		%	1	06/11/22 23:22	DB	ASTM D422-63
No.200 Sieve (0.075 mm)	86.6		%	1	06/11/22 23:22	DB	ASTM D422-63
0.030 mm (Hydrometer)	74		%	1	06/11/22 23:22	DB	ASTM D422-63
0.005 mm (Hydrometer)	26		%	1	06/11/22 23:22	DB	ASTM D422-63
0.0015 mm (Hydrometer)	0.0		%	1	06/11/22 23:22	DB	ASTM D422-63
% Gravel	0.0		%	1	06/11/22 23:22	DB	ASTM D422-63
% Sand	13.4		%	1	06/11/22 23:22	DB	ASTM D422-63
% Silt, Clay, Colloids	86.6		%	1	06/11/22 23:22	DB	ASTM D422-63

RL = Reporting Limit



## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: JD44647  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
% Gravel		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
% Sand		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
% Silt, Clay, Colloids		ASTM D422-63	SO	SGS is not certified for this parameter. <sup>a</sup>
BOD, 5 Day		SM5210 B-11 M	SO	SGS is not certified for this parameter. <sup>a</sup>

(a) Lab cert for analyte not supported by NJDEP, OQA. Only methods/analytes required for reporting by the State of NJ can be certified in NJ. Use of this analyte for compliance must be verified through the appropriate regulatory office.

Certification exceptions shown are based on the New Jersey DEP certifications. Applicability in other states may vary. Please contact your laboratory representative if additional information is required for a specific regulatory program.

## 4.2

Label Verification \_\_\_\_\_

## SGS Sample Receipt Summary

Job Number: JD44647

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/11/2022 4:41:00 PM

Delivery Method: CLIENT

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (2.0);

Cooler Temps (Corrected) °C: Cooler 1: (1.7);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD44647: Chain of Custody

Page 2 of 2

## General Chemistry

5

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD44647  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
BOD, 5 Day	GP40051/GN29126	42	<42	mg/kg	198	188	94.9	85-115%
Chemical Oxygen Demand	GP40085/GN29177	100	0.0	mg/kg				
Chemical Oxygen Demand	GP40085/GN29177	100	0.0	mg/kg	750	778	103.7	90-110%
Chemical Oxygen Demand	GP40085/GN29177			mg/kg	150	156	104.0	90-110%
Total Organic Carbon	GP40050/GN29337	100	0.00	mg/kg	2000	1880	94.0	80-120%

Associated Samples:

Batch GP40050: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

Batch GP40051: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

Batch GP40085: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD44647  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
% Gravel	GP39943/GN30190	JD44179-1A	%	3.5	4.2	-17.0	0-41%
% Sand	GP39943/GN30190	JD44179-1A	%	86.5	83.9	3.0	0-16%
% Silt, Clay, Colloids	GP39943/GN30190	JD44179-1A	%	10.0	12.0	-17.6	0-40%
0.0015 mm (Hydrometer)	GP39943/GN30190	JD44179-1A	%	3.3	3.4	-3.3	0-45%
0.005 mm (Hydrometer)	GP39943/GN30190	JD44179-1A	%	3.3	3.4	-3.3	0-48%
0.030 mm (Hydrometer)	GP39943/GN30190	JD44179-1A	%	3.3	3.4	-3.3	0-36%
0.375 Inch Sieve	GP39943/GN30190	JD44179-1A	%	99.6	98.4	1.2	0-14%
0.75 Inch Sieve	GP39943/GN30190	JD44179-1A	%	100	100	0.0	0-9%
1.5 Inch Sieve	GP39943/GN30190	JD44179-1A	%	100	100	0.0	0-20%
3 Inch Sieve	GP39943/GN30190	JD44179-1A	%	100	100	0.0	0-20%
BOD, 5 Day	GP40051/GN29126	JD44647-1	mg/kg	700	812	14.8	0-20%
Chemical Oxygen Demand	GP40085/GN29177	JD44647-1	mg/kg	27.7	27.7	0.0	0-33%
No.10 Sieve (2.00 mm)	GP39943/GN30190	JD44179-1A	%	89.7	88.6	1.3	0-14%
No.100 Sieve (0.15 mm)	GP39943/GN30190	JD44179-1A	%	10.2	12.0	-16.3	0-31%
No.16 Sieve (1.18 mm)	GP39943/GN30190	JD44179-1A	%	80.2	74.7	7.1	0-17%
No.200 Sieve (0.075 mm)	GP39943/GN30190	JD44179-1A	%	10.0	12.0	-17.6	0-40%
No.30 Sieve (0.60 mm)	GP39943/GN30190	JD44179-1A	%	50.1	47.4	5.5	0-21%
No.4 Sieve (4.75 mm)	GP39943/GN30190	JD44179-1A	%	96.5	95.9	0.7	0-13%
No.50 Sieve (0.30 mm)	GP39943/GN30190	JD44179-1A	%	13.5	16.2	-18.2	0-30%
No.8 Sieve (2.36 mm)	GP39943/GN30190	JD44179-1A	%	90.9	90.3	0.8	0-14%
Solids, Percent	GN29099	JD44648-1	%	86.9	86.5	0.5	0-5%

Associated Samples:

Batch GN29099: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

Batch GP39943: JD44647-4A, JD44647-5A, JD44647-6A

Batch GP40051: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

Batch GP40085: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD44647  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chemical Oxygen Demand	GP40085/GN29177	JD44647-1	mg/kg	27.7	5880	332	5.2N(a)	75-125%
Total Organic Carbon	GP40050/GN29337	JD44647-2	mg/kg	595	23300	15700	64.9	14-161%

Associated Samples:

Batch GP40050: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

Batch GP40085: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference.



MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD44647  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Total Organic Carbon	GP40050/GN29337	JD44647-2	mg/kg	595	23300	15600	0.6	

Associated Samples:  
Batch GP40050: JD44647-1, JD44647-2, JD44647-3, JD44647-4, JD44647-5, JD44647-6  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits

5.4  
5

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD44648

Sampling Date: 05/11/22



Report to:

Sanborn Head & Associates, Inc.  
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Total number of pages in report: 87



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD44648

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD44648-1	05/11/22	13:20	CSS	05/11/22	SO Soil	MW-559D_0-5_20220511
JD44648-2	05/11/22	13:25	CSS	05/11/22	SO Soil	MW-559D_5-10_20220511
JD44648-3	05/11/22	13:30	CSS	05/11/22	SO Soil	MW-559D_10-15_20220511
JD44648-4	05/11/22	13:35	CSS	05/11/22	SO Soil	MW-559D_15-20_20220511
JD44648-5	05/11/22	13:40	CSS	05/11/22	SO Soil	MW-559D_20-25_20220511
JD44648-6	05/11/22	13:45	CSS	05/11/22	SO Soil	MW-559D_25-30_20220511
JD44648-7	05/11/22	09:30	CSS	05/11/22	SO Soil	MW-560D_0-5_20220511
JD44648-8	05/11/22	09:35	CSS	05/11/22	SO Soil	MW-560D_5-10_20220511
JD44648-9	05/11/22	09:40	CSS	05/11/22	SO Soil	MW-560D_10-15_20220511
JD44648-10	05/11/22	09:45	CSS	05/11/22	SO Soil	MW-560D_15-20_20220511
JD44648-11	05/11/22	09:50	CSS	05/11/22	SO Soil	MW-560D_20-25_20220511
JD44648-12	05/11/22	09:55	CSS	05/11/22	SO Soil	MW-560D_25-30_20220511

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

2

**Client:** Sunoco/Evergreen

**Job No** JD44648

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 5/17/2022 3:33:35 PM

On 05/11/2022, 12 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD44648 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP32820

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD44648-7SDL, JD44648-7MSD were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MSD for Arsenic, Iron are outside control limits for sample MP32820-S2. High rpd due to possible sample nonhomogeneity.
- JD44648-7 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-1 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-2 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-4 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-6 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-8 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-11 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

### General Chemistry By Method SM2540 G 18TH ED MOD

**Matrix:** SO

**Batch ID:** GN29099

- Sample(s) JD44648-IDUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Tuesday, May 17, 2022

Page 1 of 1

## Summary of Hits

**Job Number:** JD44648  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/11/22



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD44648-1</b>	<b>MW-559D_0-5_20220511</b>					
Arsenic <sup>a</sup>		473	23		mg/kg	SW846 6010D
Iron		100000	580		mg/kg	SW846 6010D
<b>JD44648-2</b>	<b>MW-559D_5-10_20220511</b>					
Arsenic <sup>a</sup>		422	25		mg/kg	SW846 6010D
Iron		192000	620		mg/kg	SW846 6010D
<b>JD44648-3</b>	<b>MW-559D_10-15_20220511</b>					
Arsenic		9890	32		mg/kg	SW846 6010D
Iron		50500	160		mg/kg	SW846 6010D
<b>JD44648-4</b>	<b>MW-559D_15-20_20220511</b>					
Arsenic <sup>a</sup>		719	23		mg/kg	SW846 6010D
Iron		158000	590		mg/kg	SW846 6010D
<b>JD44648-5</b>	<b>MW-559D_20-25_20220511</b>					
Arsenic		1770	6.3		mg/kg	SW846 6010D
Iron		37700	160		mg/kg	SW846 6010D
<b>JD44648-6</b>	<b>MW-559D_25-30_20220511</b>					
Arsenic <sup>a</sup>		12.2	4.7		mg/kg	SW846 6010D
Iron		31300	120		mg/kg	SW846 6010D
<b>JD44648-7</b>	<b>MW-560D_0-5_20220511</b>					
Arsenic <sup>a</sup>		239	13		mg/kg	SW846 6010D
Iron		47000	330		mg/kg	SW846 6010D
<b>JD44648-8</b>	<b>MW-560D_5-10_20220511</b>					
Arsenic <sup>a</sup>		2890	15		mg/kg	SW846 6010D
Iron		101000	360		mg/kg	SW846 6010D
<b>JD44648-9</b>	<b>MW-560D_10-15_20220511</b>					
Arsenic		6940	30		mg/kg	SW846 6010D
Iron		16300	75		mg/kg	SW846 6010D

## Summary of Hits

Page 2 of 2

**Job Number:** JD44648  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/11/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD44648-10</b>	<b>MW-560D_15-20_20220511</b>					
Arsenic		10800	34		mg/kg	SW846 6010D
Iron		30500	84		mg/kg	SW846 6010D
<b>JD44648-11</b>	<b>MW-560D_20-25_20220511</b>					
Arsenic <sup>a</sup>		488	6.3		mg/kg	SW846 6010D
Iron		37900	160		mg/kg	SW846 6010D
<b>JD44648-12</b>	<b>MW-560D_25-30_20220511</b>					
Arsenic		105	2.5		mg/kg	SW846 6010D
Iron		16900	61		mg/kg	SW846 6010D

(a) Elevated detection limit due to dilution required for high interfering element.

Sample Results

Report of Analysis



Report of Analysis

<b>Client Sample ID:</b>	MW-559D_0-5_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-1	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	473	23	mg/kg	10	05/14/22	05/16/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	100000	580	mg/kg	10	05/14/22	05/16/22	ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_5-10_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-2	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	422	25	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	192000	620	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.2  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_10-15_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-3	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	60.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9890	32	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	50500	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393  
(2) Prep QC Batch: MP32820

RL = Reporting Limit

4.3  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_15-20_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-4	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	83.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	719	23	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	158000	590	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.4  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_20-25_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-5	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1770	6.3	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37700	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_25-30_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-6	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.6
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	12.2	4.7	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	31300	120	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.6  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_0-5_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-7	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	76.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	239	13	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	47000	330	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.7  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_5-10_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-8	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	71.7
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	2890	15	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	101000	360	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.8  
4



Report of Analysis

<b>Client Sample ID:</b>	MW-560D_10-15_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-9	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	67.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6940	30	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16300	75	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393  
(2) Prep QC Batch: MP32820

RL = Reporting Limit

4.9  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_15-20_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-10	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	62.1
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10800	34	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	30500	84	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393  
(2) Prep QC Batch: MP32820

RL = Reporting Limit

4.10  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20-25_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-11	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	488	6.3	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37900	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.11  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_25-30_20220511	<b>Date Sampled:</b>	05/11/22
<b>Lab Sample ID:</b>	JD44648-12	<b>Date Received:</b>	05/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	105	2.5	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16900	61	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit

4.12  
4

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

JD 44648

**SGS** SO **CHAIN OF CUSTODY** Page 1 of 1  
SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX: 732-329-3499

Please merge with SDG:

Company Name: Sanborn Head & Associates  
Project Name: Evergreen Marcus Hook  
Street Address: 1015 Virginia Dr, Suite 100  
City: Fort Washington, PA, 19034  
Project Contact: Shana Whitney  
E-mail: swhitney@sanbornhead.com  
Phone #: 603-415-6159  
Sampler(s) Name(s): Chelsey Shepsko  
Phone #: 732-858-8592  
Project Manager: Chelsey Shepsko  
Client Purchase Order #: 4862.04  
City: Concord, NH, 03301  
State: NH  
Zip: 03301  
Accounts Payable: ap@sanbornhead.com  
Chelsey Shepsko (cshepsko@sanbornhead.com)

Matrix Codes:  
DW - Drinking Water  
GW - Ground Water  
WW - Water  
SW - Surface Water  
SO - Soil  
SL - Sludge SED  
Sediment Oil - Oil  
LIQ - Other Liquid AIR  
Air  
SOL - Other Solid WP  
Wipe  
FB-Field Blank EB-  
Equipment Blank  
RB- Rinse Blank TB-  
Trip Blank

Lab Sample # Field ID / Point of Collection MECH/DI Vial # Date Time Sampled by Matrix # of bottles  
1 MW-559D 0-5 20220511 05/11/22 13:20 CSD SO 1  
2 MW-559D 5-10 20220511 05/11/22 13:25 SO 1  
3 MW-559D 10-15 20220511 05/11/22 13:30 SO 1  
4 MW-559D 15-20 20220511 05/11/22 13:35 SO 1  
5 MW-559D 20-25 20220511 05/11/22 13:40 SO 1  
6 MW-559D 25-30 20220511 05/11/22 13:45 SO 1  
7 MW-560D 0-5 20220511 05/11/22 09:30 SO 1  
8 MW-560D 5-10 20220511 05/11/22 09:35 SO 1  
9 MW-560D 10-15 20220511 05/11/22 09:40 SO 1  
10 MW-560D 15-20 20220511 05/11/22 09:45 SO 1  
11 MW-560D 20-25 20220511 05/11/22 09:50 SO 1  
12 MW-560D 25-30 20220511 05/11/22 09:55 SO 1  
MW-608D 0-5 202204 SO  
MW-608D 5-10 202204 SO  
MW-608D 10-15 202204 SO

Turnaround Time (Business days):  
Std. 10 Business Days  
5 Day RUSH  
3 Day RUSH  
2 Day RUSH  
1 Day RUSH  
other  
Emergency & Rush TIA data available via LabLink

Approved by (SGS Project Manager)/Date:  
Commercial "A" (Level 1)  
Commercial "B" (Level 2)  
FULLT1 (Level 3+4)  
NJ Reduced  
x REDT1  
Commercial "C"  
NJ Date of Known Quality Protocol Reporting  
Commercial "A" = Results Only  
Commercial "B" = Results + QC Summary  
NJ Reduced = Results + QC Summary + Partial Raw Data

Data Deliverable Information:  
NYASP Category A  
NYASP Category B  
State Forms  
x EDD Format SHA EQuIS; Stantec EQuIS

Comments / Special Instructions

Relinquished by Sampler: 1 Chelsey Shepsko Date Time: 05/11/22  
Relinquished by Sampler: 2 K. Was father Date Time: 5/11 10:41  
Relinquished by Sampler: 3 K. Was father Date Time: 5/11 10:41  
Relinquished by Sampler: 4 K. Was father Date Time: 5/11 10:41  
Relinquished by Sampler: 5 K. Was father Date Time: 5/11 10:41

Sample Custody must be documented below each time samples change possession, including courier delivery.

Custody Seal # 2-5

Initial Assessment: EG 2A  
Label Verification: \_\_\_\_\_

P:\4800\4862.04\Analytical\2022-04 AHH-7 Soil\2022-04 SGS Soil COC.xlsx

Page 1 of 1

Sanborn, Head & Associates, Inc.

JD44648: Chain of Custody

Page 1 of 2

## SGS Sample Receipt Summary

Job Number: JD44648

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/11/2022 4:41:00 PM

Delivery Method: SGS

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (2.5);

Cooler Temps (Corrected) °C: Cooler 1: (2.2);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD44648: Chain of Custody

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Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD44648

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD44648-1 Collected: 11-MAY-22 13:20 By: CSS Received: 11-MAY-22 By: KG MW-559D_0-5_20220511						
JD44648-1	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-1	SW846 6010D	16-MAY-22 11:08	ND	14-MAY-22 ND		AS,FE
JD44648-2 Collected: 11-MAY-22 13:25 By: CSS Received: 11-MAY-22 By: KG MW-559D_5-10_20220511						
JD44648-2	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-2	SW846 6010D	16-MAY-22 11:13	ND	14-MAY-22 ND		AS,FE
JD44648-3 Collected: 11-MAY-22 13:30 By: CSS Received: 11-MAY-22 By: KG MW-559D_10-15_20220511						
JD44648-3	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-3	SW846 6010D	16-MAY-22 11:18	ND	14-MAY-22 ND		FE
JD44648-3	SW846 6010D	16-MAY-22 12:07	ND	14-MAY-22 ND		AS
JD44648-4 Collected: 11-MAY-22 13:35 By: CSS Received: 11-MAY-22 By: KG MW-559D_15-20_20220511						
JD44648-4	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-4	SW846 6010D	16-MAY-22 11:33	ND	14-MAY-22 ND		AS,FE
JD44648-5 Collected: 11-MAY-22 13:40 By: CSS Received: 11-MAY-22 By: KG MW-559D_20-25_20220511						
JD44648-5	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-5	SW846 6010D	16-MAY-22 11:38	ND	14-MAY-22 ND		AS,FE
JD44648-6 Collected: 11-MAY-22 13:45 By: CSS Received: 11-MAY-22 By: KG MW-559D_25-30_20220511						
JD44648-6	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-6	SW846 6010D	16-MAY-22 11:43	ND	14-MAY-22 ND		AS,FE
JD44648-7 Collected: 11-MAY-22 09:30 By: CSS Received: 11-MAY-22 By: KG MW-560D_0-5_20220511						



Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD44648

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD44648-7	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-7	SW846 6010D	16-MAY-22 10:54	ND	14-MAY-22	ND	AS,FE
JD44648-8 Collected: 11-MAY-22 09:35 By: CSS Received: 11-MAY-22 By: KG MW-560D_5-10_20220511						
JD44648-8	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-8	SW846 6010D	16-MAY-22 11:48	ND	14-MAY-22	ND	AS,FE
JD44648-9 Collected: 11-MAY-22 09:40 By: CSS Received: 11-MAY-22 By: KG MW-560D_10-15_20220511						
JD44648-9	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-9	SW846 6010D	16-MAY-22 10:09	ND	14-MAY-22	ND	FE
JD44648-9	SW846 6010D	16-MAY-22 12:12	ND	14-MAY-22	ND	AS
JD44648-10 Collected: 11-MAY-22 09:45 By: CSS Received: 11-MAY-22 By: KG MW-560D_15-20_20220511						
JD44648-10	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-10	SW846 6010D	16-MAY-22 10:14	ND	14-MAY-22	ND	FE
JD44648-10	SW846 6010D	16-MAY-22 11:57	ND	14-MAY-22	ND	AS
JD44648-11 Collected: 11-MAY-22 09:50 By: CSS Received: 11-MAY-22 By: KG MW-560D_20-25_20220511						
JD44648-11	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-11	SW846 6010D	16-MAY-22 12:02	ND	14-MAY-22	ND	AS,FE
JD44648-12 Collected: 11-MAY-22 09:55 By: CSS Received: 11-MAY-22 By: KG MW-560D_25-30_20220511						
JD44648-12	SM2540 G 18TH ED M	11-MAY-22 15:58	BG			SOL104
JD44648-12	SW846 6010D	16-MAY-22 10:24	ND	14-MAY-22	ND	AS,FE

# SGS Internal Chain of Custody

Page 1 of 5

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD44648-1.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-1.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-1.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-1.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-1.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-1.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-1.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-1.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-1.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-1.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-1.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-1.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-1.1
JD44648-1.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-1.1
JD44648-1.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-2.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-2.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-2.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-2.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-2.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-2.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-2.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-2.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-2.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-2.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-2.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-2.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-2.1
JD44648-2.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-2.1
JD44648-2.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-3.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-3.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-3.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-3.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-3.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-3.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-3.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-3.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-3.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage

# SGS Internal Chain of Custody

Page 2 of 5

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD44648-3.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-3.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-3.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-3.1
JD44648-3.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-3.1
JD44648-3.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-4.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-4.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-4.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-4.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-4.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-4.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-4.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-4.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-4.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-4.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-4.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-4.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-4.1
JD44648-4.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-4.1
JD44648-4.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-5.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-5.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-5.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-5.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-5.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-5.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-5.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-5.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-5.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-5.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-5.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-5.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-5.1
JD44648-5.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-5.1
JD44648-5.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-6.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-6.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-6.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage

## SGS Internal Chain of Custody

Page 3 of 5

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD44648-6.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-6.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-6.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-6.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-6.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-6.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-6.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-6.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-6.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-6.1
JD44648-6.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-6.1
JD44648-6.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-7.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-7.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-7.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-7.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-7.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-7.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-7.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-7.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-7.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-7.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-7.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-7.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-7.1
JD44648-7.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-7.1
JD44648-7.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-8.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-8.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-8.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-8.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-8.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-8.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-8.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-8.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-8.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-8.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-8.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage

# SGS Internal Chain of Custody

Page 4 of 5

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD44648-8.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-8.1
JD44648-8.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-8.1
JD44648-8.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-9.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-9.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-9.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-9.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-9.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-9.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-9.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-9.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-9.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-9.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-9.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-9.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-9.1
JD44648-9.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-9.1
JD44648-9.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-10.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-10.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-10.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-10.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-10.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-10.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-10.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-10.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-10.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-10.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-10.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-10.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-10.1
JD44648-10.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-10.1
JD44648-10.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-11.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-11.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-11.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-11.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-11.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage

## SGS Internal Chain of Custody

Page 5 of 5

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD44648-11.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-11.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-11.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-11.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-11.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-11.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-11.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-11.1
JD44648-11.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-11.1
JD44648-11.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage
JD44648-12.1	Epiphania Njoku	Secured Storage	05/11/22 19:05	Return to Storage
JD44648-12.1	Secured Storage	Benjamin Gaines	05/12/22 10:07	Retrieve from Storage
JD44648-12.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
JD44648-12.1	Benjamin Gaines	Secured Staging Area	05/12/22 10:08	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD44648-12.1	Secured Staging Area	Benjamin Gaines	05/12/22 10:09	Retrieve from Storage
JD44648-12.1	Benjamin Gaines	Secured Storage	05/12/22 11:51	Return to Storage
JD44648-12.1	Secured Storage	Todd Shoemaker	05/13/22 13:14	Retrieve from Storage
JD44648-12.1	Todd Shoemaker	Secured Staging Area	05/13/22 13:14	Return to Storage
JD44648-12.1	Secured Staging Area	Alyssa Koshy	05/13/22 16:14	Retrieve from Storage
JD44648-12.1	Alyssa Koshy	Bisma Rizvi	05/13/22 17:27	Custody Transfer
JD44648-12.1	Bisma Rizvi	Secured Storage	05/14/22 15:01	Return to Storage
JD44648-12.1.1	Bisma Rizvi	Metals Digestion	05/14/22 14:52	Digestate from JD44648-12.1
JD44648-12.1.1	Metals Digestion	Bisma Rizvi	05/14/22 14:52	Digestate from JD44648-12.1
JD44648-12.1.1	Bisma Rizvi	Metals Digestate Storage	05/14/22 14:52	Return to Storage

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:50	MA52393-STD1	1		STDA
06:55	MA52393-STD2	1		STDB
07:00	MA52393-ICV1	1		
07:08	MA52393-ICB1	1		
07:13	ZZZZZZ	1		
07:24	MA52393-ICCV1	1		
07:44	MA52393-CCB1	1		
07:48	MA52393-CRI1	1		
07:53	MA52393-CRID1	1		
07:58	MA52393-ICSA1	1		
08:04	MA52393-ICSAB1	1		
08:09	MA52393-HSTD1	1		
08:14	MA52393-HSTD2	1		
08:20	ZZZZZZ	1		
08:25	ZZZZZZ	1		
08:30	ZZZZZZ	1		
08:35	MA52393-CCV1	1		
08:40	MA52393-CCB2	1		
08:45	MP32820-MB1	1		
08:50	MP32820-B1	1		
08:55	MP32820-S1	1		
09:01	MP32820-S2	1		
09:06	JD44648-7	1		
09:12	MP32820-SD1	5		
09:16	MP32820-PS1	1		
09:22	JD44648-1	1		
09:27	JD44648-2	1		
09:33	MA52393-CCV2	1		
09:38	MA52393-CCB3	1		
09:43	JD44648-3	1		
09:48	JD44648-4	1		
09:53	JD44648-5	1		
09:59	JD44648-6	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:03	JD44648-8	1		
10:09	JD44648-9	1		
10:14	JD44648-10	1		
10:19	JD44648-11	1		
10:24	JD44648-12	1		
10:29	MA52393-CCV3	1		
10:34	MA52393-CCB4	1		
10:39	ZZZZZZ	1		
10:44	MP32820-S1	5		
10:49	MP32820-S2	5		
10:54	JD44648-7	5		
10:58	MP32820-SD1	25		
11:03	MP32820-PS1	5		
11:08	JD44648-1	10		
11:13	JD44648-2	10		
11:18	JD44648-3	2		
11:23	MA52393-CCV4	1		
11:28	MA52393-CCB5	1		
11:33	JD44648-4	10		
11:38	JD44648-5	2		
11:43	JD44648-6	2		
11:48	JD44648-8	5		
11:52	JD44648-9	5		
11:57	JD44648-10	10		
12:02	JD44648-11	2		
12:07	JD44648-3	10		
12:12	JD44648-9	10		
----->	Last reportable sample/prep for job JD44648			
12:17	MA52393-CCV5	1		
12:22	MA52393-CCB6	1		
12:27	MA52393-CRI2	1		
12:32	MA52393-ICSA2	1		
12:37	MA52393-ICSAB2	1		
12:43	MA52393-CCV6	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:48	MA52393-CCB7	1		
----->	Last reportable CCB for job JD44648			
12:53	ZZZZZZ	1		
12:58	ZZZZZZ	1		
13:03	ZZZZZZ	1		
13:08	ZZZZZZ	1		
13:13	ZZZZZZ	1		
13:18	ZZZZZZ	1		
13:24	ZZZZZZ	1		
13:29	ZZZZZZ	5		
13:34	ZZZZZZ	10		
13:39	ZZZZZZ	5		
13:44	MA52393-CCV7	1		
13:49	MA52393-CCB8	1		
13:54	ZZZZZZ	1		
13:59	MP32810-S1	2		
14:04	MP32810-S2	2		
14:08	MP32810-PS1	1		ZN still out
14:14	ZZZZZZ	5		
14:19	ZZZZZZ	2		
14:24	ZZZZZZ	5		
14:28	ZZZZZZ	5		
14:33	ZZZZZZ	5		
14:39	MA52393-CCV8	1		
14:44	MA52393-CCB9	1		
14:49	ZZZZZZ	2		
14:54	ZZZZZZ	2		
14:59	ZZZZZZ	2		
15:04	ZZZZZZ	1		
15:09	ZZZZZZ	1		
15:14	MP32809-S1	2		
15:19	MP32809-S2	2		
15:24	JD44536-15	2		(sample used for QC only; not part of login JD44648)
15:29	MP32809-SD1	10		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:34	MP32809-PS1	2		
15:39	MA52393-CCV9	1		
15:44	MA52393-CCB10	1		
15:49	ZZZZZZ	2		
15:54	ZZZZZZ	2		
15:59	ZZZZZZ	2		
16:04	ZZZZZZ	2		
16:09	ZZZZZZ	2		
16:14	ZZZZZZ	5		
16:19	ZZZZZZ	5		
16:24	ZZZZZZ	5		
16:29	ZZZZZZ	2		
16:34	ZZZZZZ	2		
16:39	MA52393-CCV10	1		
16:44	MA52393-CCB11	1		
16:49	ZZZZZZ	2		
16:54	ZZZZZZ	2		
16:59	ZZZZZZ	1		
17:04	ZZZZZZ	5		
17:09	ZZZZZZ	2		
17:14	ZZZZZZ	5		
17:19	ZZZZZZ	2		
17:24	ZZZZZZ	2		
17:29	ZZZZZZ	5		
17:34	ZZZZZZ	2		
17:39	MA52393-CCV11	1		
17:44	MA52393-CCB12	1		
17:49	ZZZZZZ	2		
17:54	ZZZZZZ	1		
17:59	ZZZZZZ	1		
18:04	MP32813-MB1	1		
18:09	ZZZZZZ	1		
18:14	ZZZZZZ	2		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
18:19	ZZZZZZ	1		
18:25	ZZZZZZ	5		
18:30	ZZZZZZ	1		
18:35	ZZZZZZ	2		
18:40	MA52393-CCV12	1		
18:45	MA52393-CCB13	1		
18:50	ZZZZZZ	1		
18:55	ZZZZZZ	1		
19:00	ZZZZZZ	1		
19:05	ZZZZZZ	1		
19:10	MP32864-MB1	1		
19:16	MP32864-B1	1		
19:21	MP32864-LC1	1		
19:25	MP32864-LC2	1		
19:30	MP32864-S1	1		Ag neg
19:35	MP32864-S2	1		Ag neg
19:41	MA52393-CCV13	1		
19:46	MA52393-CCB14	1		
19:51	JD44703-16	1		(sample used for QC only; not part of login JD44648)
19:56	MP32864-SD1	5		Ag neg
20:01	MP32864-PS1	1		
20:06	ZZZZZZ	1		
20:11	ZZZZZZ	1		
20:16	ZZZZZZ	1		
20:21	ZZZZZZ	1		
20:27	ZZZZZZ	1		
20:32	ZZZZZZ	1		
20:37	ZZZZZZ	1		
20:42	MA52393-CCV14	1		
20:47	MA52393-CCB15	1		
20:52	ZZZZZZ	1		
20:57	ZZZZZZ	1		
21:02	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
21:07	ZZZZZZ	1		
21:12	ZZZZZZ	1		
21:18	ZZZZZZ	1		
21:23	ZZZZZZ	1		
21:28	ZZZZZZ	1		
21:33	ZZZZZZ	1		
21:38	ZZZZZZ	1		
21:43	MA52393-CCV15	1		
21:48	MA52393-CCB16	1		
21:53	ZZZZZZ	1		
21:58	MP32855-B1	1		CCV out
22:03	MP32855-MB1	1		CCV out
22:08	MP32855-S1	1		CCV out
22:14	MP32855-S2	1		CCV out
22:19	JD44715-5	1		(sample used for QC only; not part of login JD44648)
22:24	MP32855-SD1	5		CCV out
22:29	ZZZZZZ	1		
22:34	ZZZZZZ	1		
22:39	ZZZZZZ	1		
22:44	MA52393-CCV16	1		
22:49	MA52393-CCB17	1		
22:54	ZZZZZZ	1		
22:59	ZZZZZZ	1		
23:04	ZZZZZZ	1		
23:09	ZZZZZZ	1		
23:14	ZZZZZZ	1		
23:19	ZZZZZZ	1		
23:24	ZZZZZZ	1		
23:29	ZZZZZZ	1		
23:35	ZZZZZZ	1		
23:40	ZZZZZZ	1		
23:45	MA52393-CCV17	1		
23:50	MA52393-CCB18	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:55	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:06	ZZZZZZ	1		
00:11	ZZZZZZ	1		
00:16	ZZZZZZ	1		
00:21	ZZZZZZ	1		
00:25	MP32857-B1	1		CCV out
00:30	MP32857-MB1	1		CCV out
00:35	MP32857-S1	1		CCV out. Ca, Na high
00:41	MP32857-S2	1		CCV out. Ca, Na high
00:46	MA52393-CCV18	1		
00:51	MA52393-CCB19	1		
00:56	JD44696-13	1		(sample used for QC only; not part of login JD44648)
01:01	MP32857-SD1	5		CCV out. Ca, Na high
01:06	ZZZZZZ	1		
01:11	ZZZZZZ	1		
01:16	ZZZZZZ	1		
01:21	ZZZZZZ	1		
01:26	ZZZZZZ	1		
01:31	ZZZZZZ	1		
01:36	ZZZZZZ	1		
01:41	ZZZZZZ	1		
01:47	MA52393-CCV19	1		
01:52	MA52393-CCB20	1		
01:57	ZZZZZZ	1		
02:02	ZZZZZZ	1		
02:07	ZZZZZZ	1		
02:12	ZZZZZZ	1		
02:17	ZZZZZZ	1		
02:22	ZZZZZZ	1		
02:27	ZZZZZZ	1		
02:32	ZZZZZZ	1		
02:38	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA52393  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
02:43	MA52393-CCV20	1		
02:48	MA52393-CCB21	1		
02:53	ZZZZZZ	1		
02:58	ZZZZZZ	1		
03:04	MA52393-CCV21	1		
03:09	MA52393-CCB22	1		

Refer to raw data for calibration curve and standards.

## REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Element: Dilution	A F s e
07:00	MA52393-ICV1	1	X X
07:08	MA52393-ICB1	1	X X
07:13	ZZZZZZ	1	
07:24	MA52393-ICCV1	1	X X
07:44	MA52393-CCB1	1	X X
07:48	MA52393-CRI1	1	X X
07:53	MA52393-CRID1	1	X X
07:58	MA52393-ICSA1	1	X X
08:04	MA52393-ICSAB1	1	X X
08:09	MA52393-HSTD1	1	X X
08:14	MA52393-HSTD2	1	X X
08:20	ZZZZZZ	1	
08:25	ZZZZZZ	1	
08:30	ZZZZZZ	1	
08:35	MA52393-CCV1	1	X X
08:40	MA52393-CCB2	1	X X
08:45	MP32820-MB1	1	X X
08:50	MP32820-B1	1	X X
08:55	MP32820-S1	1	
09:01	MP32820-S2	1	
09:06	JD44648-7	1	
09:12	MP32820-SD1	5	
09:16	MP32820-PS1	1	
09:22	JD44648-1	1	
09:27	JD44648-2	1	
09:33	MA52393-CCV2	1	X X
09:38	MA52393-CCB3	1	X X
09:43	JD44648-3	1	
09:48	JD44648-4	1	
09:53	JD44648-5	1	
09:59	JD44648-6	1	
10:03	JD44648-8	1	
10:09	JD44648-9	1	X
		Element:	A F s e



REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Element: Dilution	A F s e
10:14	JD44648-10	1	X
10:19	JD44648-11	1	
10:24	JD44648-12	1	X X
10:29	MA52393-CCV3	1	X X
10:34	MA52393-CCB4	1	X X
10:39	ZZZZZZ	1	
10:44	MP32820-S1	5	X X
10:49	MP32820-S2	5	X X
10:54	JD44648-7	5	X X
10:58	MP32820-SD1	25	X X
11:03	MP32820-PS1	5	
11:08	JD44648-1	10	X X
11:13	JD44648-2	10	X X
11:18	JD44648-3	2	X
11:23	MA52393-CCV4	1	X X
11:28	MA52393-CCB5	1	X X
11:33	JD44648-4	10	X X
11:38	JD44648-5	2	X X
11:43	JD44648-6	2	X X
11:48	JD44648-8	5	X X
11:52	JD44648-9	5	
11:57	JD44648-10	10	X
12:02	JD44648-11	2	X X
12:07	JD44648-3	10	X
12:12	JD44648-9	10	X
12:17	MA52393-CCV5	1	X X
12:22	MA52393-CCB6	1	X X
12:27	MA52393-CRI2	1	X X
12:32	MA52393-ICSA2	1	X X
12:37	MA52393-ICSAB2	1	X X
12:43	MA52393-CCV6	1	X X
12:48	MA52393-CCB7	1	X X
12:53	ZZZZZZ	1	
		Element: A F s e	

# REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52393  
 Parameters: As,Fe

Time	Sample Description	Element: Dilution	A F s e
12:58	ZZZZZZ	1	
13:03	ZZZZZZ	1	
13:08	ZZZZZZ	1	
13:13	ZZZZZZ	1	
13:18	ZZZZZZ	1	
13:24	ZZZZZZ	1	
13:29	ZZZZZZ	5	
13:34	ZZZZZZ	10	
13:39	ZZZZZZ	5	
13:44	MA52393-CCV7	1	X X
13:49	MA52393-CCB8	1	X X
13:54	ZZZZZZ	1	
13:59	MP32810-S1	2	
14:04	MP32810-S2	2	
14:08	MP32810-PS1	1	ZN still out
14:14	ZZZZZZ	5	
14:19	ZZZZZZ	2	
14:24	ZZZZZZ	5	
14:28	ZZZZZZ	5	
14:33	ZZZZZZ	5	
14:39	MA52393-CCV8	1	X X
14:44	MA52393-CCB9	1	X X
14:49	ZZZZZZ	2	
14:54	ZZZZZZ	2	
14:59	ZZZZZZ	2	
15:04	ZZZZZZ	1	
15:09	ZZZZZZ	1	
15:14	MP32809-S1	2	X
15:19	MP32809-S2	2	X
15:24	JD44536-15	2	X (a)
15:29	MP32809-SD1	10	X
15:34	MP32809-PS1	2	X
15:39	MA52393-CCV9	1	X X
		Element: Dilution	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Element: Dilution	A F s e
15:44	MA52393-CCB10	1	X X
15:49	ZZZZZZ	2	
15:54	ZZZZZZ	2	
15:59	ZZZZZZ	2	
16:04	ZZZZZZ	2	
16:09	ZZZZZZ	2	
16:14	ZZZZZZ	5	
16:19	ZZZZZZ	5	
16:24	ZZZZZZ	5	
16:29	ZZZZZZ	2	
16:34	ZZZZZZ	2	
16:39	MA52393-CCV10	1	X X
16:44	MA52393-CCB11	1	X X
16:49	ZZZZZZ	2	
16:54	ZZZZZZ	2	
16:59	ZZZZZZ	1	
17:04	ZZZZZZ	5	
17:09	ZZZZZZ	2	
17:14	ZZZZZZ	5	
17:19	ZZZZZZ	2	
17:24	ZZZZZZ	2	
17:29	ZZZZZZ	5	
17:34	ZZZZZZ	2	
17:39	MA52393-CCV11	1	X X
17:44	MA52393-CCB12	1	X X
17:49	ZZZZZZ	2	
17:54	ZZZZZZ	1	
17:59	ZZZZZZ	1	
18:04	MP32813-MB1	1	X
18:09	ZZZZZZ	1	
18:14	ZZZZZZ	2	
18:19	ZZZZZZ	1	
18:25	ZZZZZZ	5	
		Element: A F s e	

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52393

Time	Sample Description	Element: Dilution	A F s e
18:30	ZZZZZZ	1	
18:35	ZZZZZZ	2	
18:40	MA52393-CCV12	1	X X
18:45	MA52393-CCB13	1	X X
18:50	ZZZZZZ	1	
18:55	ZZZZZZ	1	
19:00	ZZZZZZ	1	
19:05	ZZZZZZ	1	
19:10	MP32864-MB1	1	X
19:16	MP32864-B1	1	X
19:21	MP32864-LC1	1	X
19:25	MP32864-LC2	1	X
19:30	MP32864-S1	1	X
19:35	MP32864-S2	1	X
19:41	MA52393-CCV13	1	X X
19:46	MA52393-CCB14	1	X X
19:51	JD44703-16	1	X (a)
19:56	MP32864-SD1	5	X
20:01	MP32864-PS1	1	
20:06	ZZZZZZ	1	
20:11	ZZZZZZ	1	
20:16	ZZZZZZ	1	
20:21	ZZZZZZ	1	
20:27	ZZZZZZ	1	
20:32	ZZZZZZ	1	
20:37	ZZZZZZ	1	
20:42	MA52393-CCV14	1	X X
20:47	MA52393-CCB15	1	X X
20:52	ZZZZZZ	1	
20:57	ZZZZZZ	1	
21:02	ZZZZZZ	1	
21:07	ZZZZZZ	1	
21:12	ZZZZZZ	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52393

Time	Sample Description	Element: Dilution	A F s e
21:18	ZZZZZZ	1	
21:23	ZZZZZZ	1	
21:28	ZZZZZZ	1	
21:33	ZZZZZZ	1	
21:38	ZZZZZZ	1	
21:43	MA52393-CCV15	1	X X
21:48	MA52393-CCB16	1	X X
21:53	ZZZZZZ	1	
21:58	MP32855-B1	1	X
22:03	MP32855-MB1	1	X
22:08	MP32855-S1	1	X
22:14	MP32855-S2	1	X
22:19	JD44715-5	1	(a)
22:24	MP32855-SD1	5	X
22:29	ZZZZZZ	1	
22:34	ZZZZZZ	1	
22:39	ZZZZZZ	1	
22:44	MA52393-CCV16	1	X X
22:49	MA52393-CCB17	1	X X
22:54	ZZZZZZ	1	
22:59	ZZZZZZ	1	
23:04	ZZZZZZ	1	
23:09	ZZZZZZ	1	
23:14	ZZZZZZ	1	
23:19	ZZZZZZ	1	
23:24	ZZZZZZ	1	
23:29	ZZZZZZ	1	
23:35	ZZZZZZ	1	
23:40	ZZZZZZ	1	
23:45	MA52393-CCV17	1	X X
23:50	MA52393-CCB18	1	X X
23:55	ZZZZZZ	1	
00:00	ZZZZZZ	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Dilution	Element: A F s e
00:06	ZZZZZZ	1	
00:11	ZZZZZZ	1	
00:16	ZZZZZZ	1	
00:21	ZZZZZZ	1	
00:25	MP32857-B1	1	X
00:30	MP32857-MB1	1	X
00:35	MP32857-S1	1	X
00:41	MP32857-S2	1	X
00:46	MA52393-CCV18	1	X X
00:51	MA52393-CCB19	1	X X
00:56	JD44696-13	1	(a)
01:01	MP32857-SD1	5	X
01:06	ZZZZZZ	1	
01:11	ZZZZZZ	1	
01:16	ZZZZZZ	1	
01:21	ZZZZZZ	1	
01:26	ZZZZZZ	1	
01:31	ZZZZZZ	1	
01:36	ZZZZZZ	1	
01:41	ZZZZZZ	1	
01:47	MA52393-CCV19	1	X X
01:52	MA52393-CCB20	1	X X
01:57	ZZZZZZ	1	
02:02	ZZZZZZ	1	
02:07	ZZZZZZ	1	
02:12	ZZZZZZ	1	
02:17	ZZZZZZ	1	
02:22	ZZZZZZ	1	
02:27	ZZZZZZ	1	
02:32	ZZZZZZ	1	
02:38	ZZZZZZ	1	
02:43	MA52393-CCV20	1	X X
02:48	MA52393-CCB21	1	X X
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
 Analyst: ND      Run ID: MA52393  
 Parameters: As,Fe

Time	Sample Description	Dilution	Element: A F s e
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02:53	ZZZZZZ	1	
02:58	ZZZZZZ	1	
03:04	MA52393-CCV21	1	X X
03:09	MA52393-CCB22	1	X X

(a) Sample used for QC only; not part of login JD44648.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:50	MA52393-STD1	5021 R	236200 R	40389 R	11370 R
06:55	MA52393-STD2	4802	222510	40117	10102
07:00	MA52393-ICV1	4911	227820	40091	10418
07:08	MA52393-ICB1	5011	237070	40522	11365
07:13	ZZZZZZ	4973	234870	40312	11139
07:24	MA52393-ICCV1	4902	229190	40303	10425
07:44	MA52393-CCB1	4990	237890	40558	11327
07:48	MA52393-CRI1	4968	235420	40186	11149
07:53	MA52393-CRID1	4993	236320	40473	11285
07:58	MA52393-ICSA1	4598	210440	39657	9422
08:04	MA52393-ICSAB1	4589	210570	39501	9411
08:09	MA52393-HSTD1	4860	231770	40366	11006
08:14	MA52393-HSTD2	4585	210430	38892	9373
08:20	ZZZZZZ	5016	234770	40567	11507
08:25	ZZZZZZ	4965	236050	40696	11550
08:30	ZZZZZZ	4998	235930	40141	11320
08:35	MA52393-CCV1	4887	228390	40072	10404
08:40	MA52393-CCB2	4995	237300	40053	11319
08:45	MP32820-MB1	5056	238550	40994	11442
08:50	MP32820-B1	4955	233280	40589	10705
08:55	MP32820-S1	5324	246420	46439	10666
09:01	MP32820-S2	5346	245790	45700	10715
09:06	JD44648-7	5378	247120	45102	10961
09:12	MP32820-SD1	5111	239300	41282	11119
09:16	MP32820-PS1	5270	242700	44581	10756
09:22	JD44648-1	No results reported for the elements associated with this internal standard.			
09:27	JD44648-2	No results reported for the elements associated with this internal standard.			
09:33	MA52393-CCV2	4862	229190	39233	10413
09:38	MA52393-CCB3	4963	235080	38985	11325
09:43	JD44648-3	No results reported for the elements associated with this internal standard.			
09:48	JD44648-4	No results reported for the elements associated with this internal standard.			
09:53	JD44648-5	No results reported for the elements associated with this internal standard.			
09:59	JD44648-6	No results reported for the elements associated with this internal standard.			



## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:03	JD44648-8	No results reported for the elements associated with this internal standard.			
10:09	JD44648-9	5185	236050	42088	10553
10:14	JD44648-10	5314	244800	43195	10838
10:19	JD44648-11	No results reported for the elements associated with this internal standard.			
10:24	JD44648-12	5439	244640	43353	10922
10:29	MA52393-CCV3	4900	228510	39902	10408
10:34	MA52393-CCB4	5039	234870	39455	11394
10:39	ZZZZZZ	5283	239910	41834	11060
10:44	MP32820-S1	5204	235090	41713	10919
10:49	MP32820-S2	5212	235700	41320	11042
10:54	JD44648-7	5185	235760	40968	11148
10:58	MP32820-SD1	5150	235200	39977	11252
11:03	MP32820-PS1	5157	236370	40906	11055
11:08	JD44648-1	5125	236850	40565	11215
11:13	JD44648-2	5078	235220	40137	11298
11:18	JD44648-3	5235	240870	42564	10700
11:23	MA52393-CCV4	4982	228900	39469	10549
11:28	MA52393-CCB5	5120	236830	39906	11496
11:33	JD44648-4	5060	233660	40454	11170
11:38	JD44648-5	5218	237660	41530	10885
11:43	JD44648-6	5278	242340	41785	11237
11:48	JD44648-8	5150	235760	40816	11206
11:52	JD44648-9	5147	234300	40332	11054
11:57	JD44648-10	5130	236940	40317	11256
12:02	JD44648-11	5290	240350	42072	10968
12:07	JD44648-3	5137	236570	40690	11143
12:12	JD44648-9	5169	236130	40531	11212
12:17	MA52393-CCV5	4977	226980	39431	10516
12:22	MA52393-CCB6	5067	234790	39810	11399
12:27	MA52393-CRI2	5030	232450	39346	11200
12:32	MA52393-ICSA2	4628	208780	38723	9435
12:37	MA52393-ICSAB2	4631	207450	38655	9436
12:43	MA52393-CCV6	4998	227760	39981	10521

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:48	MA52393-CCB7	5112	234660	40152	11447
12:53	ZZZZZZ	5287	235360	42609	10992
12:58	ZZZZZZ	5358	238560	42411	10935
13:03	ZZZZZZ	5319	239110	41968	10926
13:08	ZZZZZZ	5327	240380	42274	10933
13:13	ZZZZZZ	5347	238210	42722	10931
13:18	ZZZZZZ	5486	246480	44004	10997
13:24	ZZZZZZ	5149	999999 !	40526	11616
13:29	ZZZZZZ	4876	223630	39316	10358
13:34	ZZZZZZ	4857	221700	39387	10315
13:39	ZZZZZZ	4702	215050	39025	9853
13:44	MA52393-CCV7	4972	225160	39658	10456
13:49	MA52393-CCB8	5064	234540	39780	11333
13:54	ZZZZZZ	5142	234240	40837	11524
13:59	MP32810-S1	5037	227520	40446	10513
14:04	MP32810-S2	5097	230760	40643	10760
14:08	MP32810-PS1	No results reported for the elements associated with this internal standard.			
14:14	ZZZZZZ	5241	234310	41478	10919
14:19	ZZZZZZ	5234	231820	41770	10862
14:24	ZZZZZZ	5136	233370	40560	11007
14:28	ZZZZZZ	5102	231380	40581	10876
14:33	ZZZZZZ	5181	231900	40825	10987
14:39	MA52393-CCV8	4965	225970	39821	10439
14:44	MA52393-CCB9	5092	231490	39677	11381
14:49	ZZZZZZ	5138	232210	41416	10933
14:54	ZZZZZZ	5133	230770	41426	10528
14:59	ZZZZZZ	5036	228320	41126	10324
15:04	ZZZZZZ	5109	235670	40381	11404
15:09	ZZZZZZ	4999	227370	40279	10670
15:14	MP32809-S1	5095	230210	40897	10853
15:19	MP32809-S2	5087	229200	40695	10873
15:24	JD44536-15	5120	229360	41081	10960
15:29	MP32809-SD1	5150	231710	40312	11204

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:34	MP32809-PS1	5092	229580	40894	10830
15:39	MA52393-CCV9	4960	224640	39947	10419
15:44	MA52393-CCB10	5064	230290	39805	11312
15:49	ZZZZZZ	5129	227420	41075	10850
15:54	ZZZZZZ	5105	226900	40617	11002
15:59	ZZZZZZ	5053	225980	40626	10845
16:04	ZZZZZZ	5182	228870	40945	11042
16:09	ZZZZZZ	5151	229250	40861	11054
16:14	ZZZZZZ	5120	230310	40305	11024
16:19	ZZZZZZ	5127	229580	40123	11083
16:24	ZZZZZZ	5103	227910	40299	11088
16:29	ZZZZZZ	5113	228310	40359	10968
16:34	ZZZZZZ	5141	231430	40522	11012
16:39	MA52393-CCV10	4957	223420	39470	10412
16:44	MA52393-CCB11	5069	232230	39533	11325
16:49	ZZZZZZ	5151	231180	40991	11005
16:54	ZZZZZZ	5123	227100	40483	11040
16:59	ZZZZZZ	5115	228190	40280	11419
17:04	ZZZZZZ	4934	222390	39886	10259
17:09	ZZZZZZ	5305	235430	42198	10940
17:14	ZZZZZZ	4970	224240	39614	10622
17:19	ZZZZZZ	5340	235250	41957	10979
17:24	ZZZZZZ	4917	223050	40320	10236
17:29	ZZZZZZ	5158	227620	40228	11148
17:34	ZZZZZZ	5233	233880	41217	10932
17:39	MA52393-CCV11	4990	223300	39190	10485
17:44	MA52393-CCB12	5080	231350	39440	11369
17:49	ZZZZZZ	5150	230330	40746	10823
17:54	ZZZZZZ	5115	232550	39636	11417
17:59	ZZZZZZ	5059	232060	39799	11157
18:04	MP32813-MB1	5117	229570	39758	11445
18:09	ZZZZZZ	5146	232920	40072	11472
18:14	ZZZZZZ	5015	227140	39801	10780

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
18:19	ZZZZZZ	4941	223070	39480	10386
18:25	ZZZZZZ	5072	229620	39645	11101
18:30	ZZZZZZ	4961	222690	39711	10375
18:35	ZZZZZZ	5019	226490	39667	10667
18:40	MA52393-CCV12	5039	226600	39383	10567
18:45	MA52393-CCB13	5165	233520	39617	11518
18:50	ZZZZZZ	5196	234380	40068	11640
18:55	ZZZZZZ	5122	232470	39551	11406
19:00	ZZZZZZ	5135	235310	39480	11519
19:05	ZZZZZZ	5462	228840	42090	10814
19:10	MP32864-MB1	5236	238180	40850	11641
19:16	MP32864-B1	5124	232160	40156	10920
19:21	MP32864-LC1	5340	238290	41760	11003
19:25	MP32864-LC2	5329	237770	41732	10973
19:30	MP32864-S1	5249	238890	41744	10737
19:35	MP32864-S2	5239	237020	41182	10669
19:41	MA52393-CCV13	5028	228700	39380	10600
19:46	MA52393-CCB14	5159	238230	39415	11561
19:51	JD44703-16	5340	240350	41646	11166
19:56	MP32864-SD1	5233	237220	39998	11381
20:01	MP32864-PS1	5199	237360	41189	10771
20:06	ZZZZZZ	5187	234040	40319	11024
20:11	ZZZZZZ	5416	242870	42611	10810
20:16	ZZZZZZ	5403	244630	42222	10952
20:21	ZZZZZZ	5417	245600	43210	11027
20:27	ZZZZZZ	5269	238210	41171	11116
20:32	ZZZZZZ	5183	236950	41105	10983
20:37	ZZZZZZ	5344	242040	41533	11162
20:42	MA52393-CCV14	5029	229770	39093	10629
20:47	MA52393-CCB15	5149	239040	39540	11568
20:52	ZZZZZZ	5181	234910	40425	11041
20:57	ZZZZZZ	5227	236980	40812	11176
21:02	ZZZZZZ	5209	237740	40715	11153

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
21:07	ZZZZZZ	5206	235750	40825	11119
21:12	ZZZZZZ	5206	238090	40708	11083
21:18	ZZZZZZ	5181	236580	40730	11074
21:23	ZZZZZZ	5227	238030	40816	11138
21:28	ZZZZZZ	5230	237490	40840	11183
21:33	ZZZZZZ	5340	243120	41727	11190
21:38	ZZZZZZ	5252	239170	40914	11182
21:43	MA52393-CCV15	5034	232310	39067	10669
21:48	MA52393-CCB16	5156	241780	39029	11611
21:53	ZZZZZZ	5267	241640	41129	11147
21:58	MP32855-B1	5110	237000	39813	10980
22:03	MP32855-MB1	5203	243510	39911	11729
22:08	MP32855-S1	4965	228320	39419	10459
22:14	MP32855-S2	4956	231270	39532	10437
22:19	JD44715-5	4985	231210	39237	10615
22:24	MP32855-SD1	5067	235810	38827	11223
22:29	ZZZZZZ	4954	232170	39244	10802
22:34	ZZZZZZ	4959	232630	39356	10684
22:39	ZZZZZZ	5087	238150	39661	11180
22:44	MA52393-CCV16	5020	232870	39024	10648
22:49	MA52393-CCB17	5158	241940	39165	11626
22:54	ZZZZZZ	5047	237890	39481	10999
22:59	ZZZZZZ	4943	233340	39308	10680
23:04	ZZZZZZ	5203	244580	39846	11734
23:09	ZZZZZZ	4986	234150	39326	10866
23:14	ZZZZZZ	4945	232500	39246	10647
23:19	ZZZZZZ	5105	238170	39497	11207
23:24	ZZZZZZ	5050	237350	39667	11007
23:29	ZZZZZZ	4997	233240	39156	10776
23:35	ZZZZZZ	4987	230900	39281	10571
23:40	ZZZZZZ	4770	220000	38571	9948
23:45	MA52393-CCV17	5115	235920	39139	10804
23:50	MA52393-CCB18	5222	244130	39581	11739

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
23:55	ZZZZZZ	5002	229910	39146	10593
00:00	ZZZZZZ	4756	218590	38588	9924
00:06	ZZZZZZ	5097	235280	39981	10804
00:11	ZZZZZZ	5140	240370	39550	11362
00:16	ZZZZZZ	5223	244260	39211	11798
00:21	ZZZZZZ	5210	243950	40177	11511
00:25	MP32857-B1	5211	242410	39947	11186
00:30	MP32857-MB1	5283	245930	39585	11892
00:35	MP32857-S1	4596	210220	38146	9180
00:41	MP32857-S2	4596	209000	37842	9182
00:46	MA52393-CCV18	5134	238120	38704	10877
00:51	MA52393-CCB19	5273	246800	39014	11871
00:56	JD44696-13	4521	207370	37816	9136
01:01	MP32857-SD1	4985	230240	38710	10392
01:06	ZZZZZZ	4847	217340	38908	9538
01:11	ZZZZZZ	4865	218310	38797	9553
01:16	ZZZZZZ	No results reported for the elements associated with this internal standard.			
01:21	ZZZZZZ	5187	242430	39973	11169
01:26	ZZZZZZ	5217	242360	39586	11224
01:31	ZZZZZZ	5140	239780	39325	10985
01:36	ZZZZZZ	4985	227240	39564	10164
01:41	ZZZZZZ	4778	217840	37847	9739
01:47	MA52393-CCV19	5146	240960	39188	10918
01:52	MA52393-CCB20	5313	250620	39508	11946
01:57	ZZZZZZ	5330	251150	39520	12015
02:02	ZZZZZZ	5340	250540	40036	12021
02:07	ZZZZZZ	4964	227780	38872	10112
02:12	ZZZZZZ	4762	218420	38113	9731
02:17	ZZZZZZ	4624	214200	38042	9358
02:22	ZZZZZZ	5362	250810	38863	12046
02:27	ZZZZZZ	5317	252150	39497	11991
02:32	ZZZZZZ	4130	185630	35807	8047
02:38	ZZZZZZ	4145	185360	35535	8089

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
02:43	MA52393-CCV20	5169	240560	38157	10956
02:48	MA52393-CCB21	5297	249010	38577	11922
02:53	ZZZZZZ	4335	196200	35984	8586
02:58	ZZZZZZ	4466	206440	35855	9097
03:04	MA52393-CCV21	5163	239960	37563	10950
03:09	MA52393-CCB22	5306	248900	37587	11948

R = Reference for ISTD limits.    ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52393 Units: ug/l

Time: Sample ID:			07:08 ICB1		07:44 CCB1		08:40 CCB2		09:38 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.900	<3.0	-0.900	<3.0	0.400	<3.0	-0.500	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1								
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	1.30	<100	1.80	<100	4.40	<100	21.1	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3								
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52393      Units: ug/l

Time: Sample ID:			07:08 ICB1		07:44 CCB1		08:40 CCB2		09:38 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.2	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52393 Units: ug/l

Time: Sample ID:			10:34 CCB4		11:28 CCB5		12:22 CCB6		12:48 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.200	<3.0	0.200	<3.0	-0.500	<3.0	0.200	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1								
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	8.90	<100	3.30	<100	1.90	<100	4.20	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3								
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52393 Units: ug/l

Time: Sample ID:			10:34 CCB4		11:28 CCB5		12:22 CCB6		12:48 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.2	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52393 Units: ug/l

Time:		07:24	
Sample ID:		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1990	99.5
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	39100	97.8
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52393      Units: ug/l

Time:	07:24
Sample ID:	ICCV
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time: Sample ID:		07:00 ICV1	% Rec	CCV	08:35 CCV1	% Rec	CCV	09:33 CCV2	% Rec
Metal	True	Results		True	Results		True	Results	
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2090	104.5	2000	1990	99.5	2000	1960	98.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	41500	103.8	40000	38800	97.0	40000	38300	95.8
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time:		07:00		08:35		09:33	
Sample ID:		ICV	ICV1	CCV	CCV1	CCV	CCV2
Metal		True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time: Sample ID:		10:29 CCV3		11:23 CCV4		12:17 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1970	98.5	2000	1960	98.0	2000	1940	97.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	37600	94.0	40000	37900	94.8	40000	37600	94.0
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time:		10:29			11:23			12:17		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time: Sample ID: CCV		12:43 CCV6		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	anr			
Arsenic	2000	1960	98.0	
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	40000	37700	94.3	
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time:		12:43	
Sample ID:		CCV6	
Metal	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

## HIGH STANDARD CHECK SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		08:09		08:14		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	anr					
Arsenic	8000	7850	98.1			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron				200000	191000	95.5
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

HIGH STANDARD CHECK SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52393      Units: ug/l

Time:		08:09		08:14	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52393 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:48 CRI1		07:53 CRID1		12:27 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	7.90	98.8	3.00	100.0	8.10	101.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		106	106.0			101	101.0
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52393 Units: ug/l

Time:					07:48		07:53		12:27	
Sample ID:	CRI	CRIA	CRID	CRID	CRID1		CRID1		CRID2	
Metal	True	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.7

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52393      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:58 ICSAB1 Results	% Rec	08:04 ICSAB1 Results	% Rec	12:32 ICSAB2 Results	% Rec	12:37 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	488000	97.6	500000	100.0	460000	92.0	472000	94.4
Antimony		1000	-1.90		1000	100.0	-1.10		962	96.2
Arsenic		1000	-0.800		997	99.7	2.20		949	94.9
Barium		500	-45.3		451	90.2	-42.7		431	86.2
Beryllium		500	0.400		480	96.0	0.300		446	89.2
Bismuth		500	0.700		485	97.0	-1.20		455	91.0
Boron		500	-2.50		468	93.6	-4.00		448	89.6
Cadmium		1000	0.00		998	99.8	-0.300		958	95.8
Calcium	400000	400000	387000	96.8	394000	98.5	368000	92.0	373000	93.3
Cerium			52.4		525*		53.7		519*	
Chromium		500	2.30		470	94.0	2.30		455	91.0
Cobalt		500	0.600		461	92.2	0.300		441	88.2
Copper		500	-7.10		489	97.8	-9.99		471	94.2
Iron	200000	200000	197000	98.5	198000	99.0	188000	94.0	187000	93.5
Lead		1000	0.300		918	91.8	0.500		897	89.7
Lithium		500	3.40		561	112.2	4.80		527	105.4
Magnesium	500000	500000	499000	99.8	489000	97.8	475000	95.0	462000	92.4
Manganese		500	0.500		498	99.6	0.00		486	97.2
Molybdenum		500	-2.90		467	93.4	-3.30		436	87.2
Nickel		1000	2.10		913	91.3	1.50		891	89.1
Phosphorus		500	-8.20		460	92.0	-9.10		445	89.0
Potassium			-44.3		-28.8		-46.3		-38.3	
Selenium		1000	2.00		921	92.1	-9.70		844	84.4
Silicon		500	-22.6		445	89.0	-20.0		426	85.2
Silver		1000	1.40		1020	102.0	-4.80		981	98.1
Sodium			-98.6		-104		-139		-131	
Strontium		500	0.800		496	99.2	0.700		467	93.4
Sulfur		500	8.10		493	98.6	-2.00		444	88.8
Thallium		1000	0.300		933	93.3	2.10		881	88.1
Tin		500	-4.50		454	90.8	-4.70		439	87.8
Titanium		500	-1.10		474	94.8	-1.50		460	92.0
Tungsten		500	1.40		486	97.2	0.100		461	92.2
Vanadium		500	-12.5		466	93.2	-11.2		462	92.4



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52393 Units: ug/l

Time:				07:58			08:04			12:32			12:37
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc 1000 1.20 918 91.8 0.500 870 87.0

Zirconium 500 1.20 436 87.2 0.00 422 84.4

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.8

6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/14/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	2.7	8.1		
Antimony	2.0	.22	.41		
Arsenic	2.0	.13	.28	0.70	<2.0
Barium	20	.1	1.9		
Beryllium	0.20	.02	.08		
Bismuth	2.0	.21	.52		
Boron	10	.1	3.7		
Cadmium	0.50	.02	.07		
Calcium	500	.77	21		
Chromium	1.0	.05	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.68	.84		
Iron	50	1.5	19	13.1	<50
Lead	2.0	.16	.41		
Lithium	5.0	.37	.92		
Magnesium	500	5.4	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.05	.32		
Nickel	4.0	.03	.35		
Phosphorus	20	.18	3.3		
Potassium	1000	7.7	32		
Selenium	2.0	.2	.65		
Silicon	20	.13	11		
Silver	0.50	.09	.17		
Sodium	1000	2.3	78		
Strontium	5.0	.04	.18		
Sulfur	10	.41	3.9		
Thallium	1.0	.16	.58		
Tin	20	.09	3.8		
Titanium	1.0	.09	.34		
Tungsten	5.0	.2	1.8		
Vanadium	5.0	.08	.19		
Zinc	5.0	.02	2.3		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/14/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zirconium 2.0 .05 .54

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	239	880	262	244.9N(a) 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	47000	79400	3270	990.1(b) 75-125
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7	Spikelot	QC	
	Original MS	MPSPK2	% Rec	Limits

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes

- (\*) Outside of QC limits
- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- (b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

6.2.2

6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7 Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	239	543	262	116.1	45.2 (a)	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	47000	62500	3270	473.7(b)	23.8 (a)	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					
Zirconium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	---------------------------	--------------------	-------	------------	-------------

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes

- (\*) Outside of QC limits
- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) High rpd due to possible sample nonhomogeneity.
- (b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD44648

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820

Methods: SW846 6010D

Matrix Type: SOLID

Units: mg/kg

Prep Date:

05/14/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	192	200	96.0	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2500	2500	100.0	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zirconium

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.3

6

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/14/22

Metal		JD44648-7 Original SDL 1:5		%DIF	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	1830	1930	5.6	0-10	
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	359000	376000	4.8	0-10	
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/14/22

	JD44648-7		QC
Metal	Original SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.4

6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

05/14/22

Metal	Sample ml	Final ml	JD44648-7 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Phosphorus										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Strontium										
Sulfur										
Thallium										
Tin										
Titanium										
Tungsten										
Vanadium										
Zinc										

POST DIGESTATE SPIKE SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

05/14/22

Metal	Sample ml	Final ml	JD44648-7 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
-------	--------------	-------------	------------------	---------------	------	-------------	----------------	---------------	-------	--------------

Zirconium

Associated samples MP32820: JD44648-1, JD44648-2, JD44648-3, JD44648-4, JD44648-5, JD44648-6, JD44648-7, JD44648-8, JD44648-9, JD44648-10, JD44648-11, JD44648-12

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(\*\*) Corr. sample result = Raw \* (sample volume / final volume)

(anr) Analyte not requested

## General Chemistry

### QC Data Summaries

7

---

Includes the following where applicable:

- Percent Solids Raw Data Summary

## Percent Solids Raw Data Summary

Page 1 of 2

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD44648-1      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_0-5\_20220511

Wet Weight (Total)	30.59	g
Tare Weight	24.96	g
Dry Weight (Total)	29.85	g
Solids, Percent	86.9	%

---

**Sample:** JD44648-2      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_5-10\_20220511

Wet Weight (Total)	34.48	g
Tare Weight	26.42	g
Dry Weight (Total)	32.94	g
Solids, Percent	80.9	%

---

**Sample:** JD44648-3      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_10-15\_20220511

Wet Weight (Total)	35.31	g
Tare Weight	28.67	g
Dry Weight (Total)	32.69	g
Solids, Percent	60.5	%

---

**Sample:** JD44648-4      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_15-20\_20220511

Wet Weight (Total)	34.51	g
Tare Weight	26.07	g
Dry Weight (Total)	33.12	g
Solids, Percent	83.5	%

---

**Sample:** JD44648-5      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_20-25\_20220511

Wet Weight (Total)	35.65	g
Tare Weight	28.17	g
Dry Weight (Total)	33.02	g
Solids, Percent	64.8	%

---

**Sample:** JD44648-6      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-559D\_25-30\_20220511

Wet Weight (Total)	32.54	g
Tare Weight	23.93	g
Dry Weight (Total)	31.47	g
Solids, Percent	87.6	%

---

## Percent Solids Raw Data Summary

Page 2 of 2

**Job Number:** JD44648  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD44648-7      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_0-5\_20220511

Wet Weight (Total)	28.62	g
Tare Weight	20.99	g
Dry Weight (Total)	26.82	g
Solids, Percent	76.4	%

---

**Sample:** JD44648-8      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_5-10\_20220511

Wet Weight (Total)	32.07	g
Tare Weight	23.88	g
Dry Weight (Total)	29.75	g
Solids, Percent	71.7	%

---

**Sample:** JD44648-9      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_10-15\_20220511

Wet Weight (Total)	26.52	g
Tare Weight	18.71	g
Dry Weight (Total)	23.94	g
Solids, Percent	67	%

---

**Sample:** JD44648-10      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_15-20\_20220511

Wet Weight (Total)	27.58	g
Tare Weight	19.48	g
Dry Weight (Total)	24.51	g
Solids, Percent	62.1	%

---

**Sample:** JD44648-11      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_20-25\_20220511

Wet Weight (Total)	30.57	g
Tare Weight	21.97	g
Dry Weight (Total)	27.55	g
Solids, Percent	64.9	%

---

**Sample:** JD44648-12      **Analyzed:** 12-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-560D\_25-30\_20220511

Wet Weight (Total)	30.86	g
Tare Weight	23.23	g
Dry Weight (Total)	29.38	g
Solids, Percent	80.6	%

---



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD45265

Sampling Dates: 05/19/22 - 05/20/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
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ATTN: Chelsey Shepsko

Total number of pages in report: 75



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD45265

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45265-1	05/19/22	14:15 MDL	05/20/22	SO	Soil	MW-360D 15-25'
JD45265-1A	05/19/22	14:15 MDL	05/20/22	SO	Soil	MW-360D 15-25'
JD45265-2	05/19/22	16:15 MDL	05/20/22	SO	Soil	MW-608D 14-28'
JD45265-2A	05/19/22	16:15 MDL	05/20/22	SO	Soil	MW-608D 14-28'
JD45265-3	05/19/22	16:45 MDL	05/20/22	SO	Soil	MW-608D 28-36'
JD45265-3A	05/19/22	16:45 MDL	05/20/22	SO	Soil	MW-608D 28-36'
JD45265-4	05/19/22	17:30 MDL	05/20/22	SO	Soil	MW-609D 23-33'
JD45265-4A	05/19/22	17:30 MDL	05/20/22	SO	Soil	MW-609D 23-33'
JD45265-5	05/20/22	07:30 MDL	05/20/22	SO	Soil	AOI7 BH-22
JD45265-5A	05/20/22	07:30 MDL	05/20/22	SO	Soil	AOI7 BH-22

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

2

**Client:** Sunoco/Evergreen

**Job No:** JD45265

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/1/2022 9:32:21 AM

On 05/20/2022, 5 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.3 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45265 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP33120

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45265-4SDL, JD45265-4MSD were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MSD for Arsenic are outside control limits for sample MP33120-S2. High rpd due to possible sample nonhomogeneity.
- JD45265-2 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

### General Chemistry By Method LLOYD KAHN 1988 MOD

**Matrix:** SO

**Batch ID:** GP40279

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45265-2AMS, JD45265-2AMSD were used as the QC samples for Total Organic Carbon.

### General Chemistry By Method SM2540 G 18TH ED MOD

**Matrix:** SO

**Batch ID:** GN29622

- Sample(s) JD45265-1DUP were used as the QC samples for Solids, Percent.
- RPD(s) for Duplicate for Solids, Percent are outside control limits for sample GN29622-D1. High RPD due to nature of sample matrix.

### General Chemistry By Method SM5210 B-11 M

**Matrix:** SO

**Batch ID:** GP40242

- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45265-1ADUP were used as the QC samples for BOD, 5 Day.
- RPD(s) for Duplicate for BOD, 5 Day are outside control limits for sample GP40242-D1. Probable cause due to sample homogeneity.
- JD45265-1A for BOD, 5 Day: Analysis done out of holding time.
- JD45265-2A for BOD, 5 Day: Analysis done out of holding time.
- JD45265-3A for BOD, 5 Day: Analysis done out of holding time.
- JD45265-4A for BOD, 5 Day: Analysis done out of holding time.
- JD45265-5A for BOD, 5 Day: Analysis done out of holding time.

Wednesday, June 1, 2022

Page 1 of 2

## General Chemistry By Method SM5220C11M,HACH8000M

**Matrix:** SO

**Batch ID:** GP40345

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45265-1ADUP, JD45265-1AMS were used as the QC samples for Chemical Oxygen Demand.
- Matrix Spike Recovery(s) for Chemical Oxygen Demand are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Wednesday, June 1, 2022

Page 2 of 2

## Summary of Hits

**Job Number:** JD45265  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/19/22 thru 05/20/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD45265-1</b>	<b>MW-360D 15-25'</b>					
Arsenic		941	2.7		mg/kg	SW846 6010D
<b>JD45265-1A</b>	<b>MW-360D 15-25'</b>					
BOD, 5 Day <sup>a</sup>		806	59		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand		48500	2700		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon		23700	140		mg/kg	LLOYD KAHN 1988 MOD
<b>JD45265-2</b>	<b>MW-608D 14-28'</b>					
Arsenic <sup>b</sup>		119	13		mg/kg	SW846 6010D
<b>JD45265-2A</b>	<b>MW-608D 14-28'</b>					
BOD, 5 Day <sup>a</sup>		2070	52		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand		103000	2500		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon		28600	120		mg/kg	LLOYD KAHN 1988 MOD
<b>JD45265-3</b>	<b>MW-608D 28-36'</b>					
Arsenic		12400	62		mg/kg	SW846 6010D
<b>JD45265-3A</b>	<b>MW-608D 28-36'</b>					
BOD, 5 Day <sup>a</sup>		2220	65		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand		67300	3100		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon		31900	160		mg/kg	LLOYD KAHN 1988 MOD
<b>JD45265-4</b>	<b>MW-609D 23-33'</b>					
Arsenic		6900	29		mg/kg	SW846 6010D
<b>JD45265-4A</b>	<b>MW-609D 23-33'</b>					
BOD, 5 Day <sup>a</sup>		2020	65		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand		63400	3000		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon		32100	150		mg/kg	LLOYD KAHN 1988 MOD
<b>JD45265-5</b>	<b>AOI7 BH-22</b>					
Arsenic		2400	14		mg/kg	SW846 6010D

Summary of Hits

Job Number: JD45265  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 05/19/22 thru 05/20/22



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD45265-5A      AOI7 BH-22

BOD, 5 Day <sup>a</sup>	4970	63		mg/kg	SM5210 B-11 M
Chemical Oxygen Demand	139000	2900		mg/kg	SM5220C11M,HACH8000M
Total Organic Carbon	67600	150		mg/kg	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.  
(b) Elevated detection limit due to dilution required for high interfering element.

Sample Results

Report of Analysis



Report of Analysis

<b>Client Sample ID:</b>	MW-360D 15-25'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-1	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	71.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	941	2.7	mg/kg	1	05/26/22	05/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52478  
(2) Prep QC Batch: MP33120

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-360D 15-25'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-1A	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	71.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	806	59	mg/kg	1	05/21/22 22:43	DB	SM5210 B-11 M
Chemical Oxygen Demand	48500	2700	mg/kg	1	05/27/22 13:08	MK	SM5220C11M,HACH8000M
Total Organic Carbon	23700	140	mg/kg	1	05/27/22 10:34	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

4.2  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D 14-28'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-2	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	119	13	mg/kg	5	05/26/22	05/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52478  
(2) Prep QC Batch: MP33120  
  
(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.3  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D 14-28'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-2A	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	2070	52	mg/kg	1	05/21/22 22:45	DB	SM5210 B-11 M
Chemical Oxygen Demand	103000	2500	mg/kg	1	05/27/22 13:08	MK	SM5220C11M,HACH8000M
Total Organic Carbon	28600	120	mg/kg	1	05/27/22 14:42	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

4.4  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-608D 28-36'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-3	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12400	62	mg/kg	20	05/26/22	05/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52478  
(2) Prep QC Batch: MP33120

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D 28-36'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-3A	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	2220	65	mg/kg	1	05/21/22 22:47	DB	SM5210 B-11 M
Chemical Oxygen Demand	67300	3100	mg/kg	1	05/27/22 13:08	MK	SM5220C11M,HACH8000M
Total Organic Carbon	31900	160	mg/kg	1	05/27/22 11:22	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D 23-33'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-4	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6900	29	mg/kg	10	05/26/22	05/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52478  
(2) Prep QC Batch: MP33120

RL = Reporting Limit

4.7  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D 23-33'	<b>Date Sampled:</b>	05/19/22
<b>Lab Sample ID:</b>	JD45265-4A	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	64.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	2020	65	mg/kg	1	05/21/22 22:48	DB	SM5210 B-11 M
Chemical Oxygen Demand	63400	3000	mg/kg	1	05/27/22 13:08	MK	SM5220C11M,HACH8000M
Total Organic Carbon	32100	150	mg/kg	1	05/27/22 16:23	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	AOI7 BH-22	<b>Date Sampled:</b>	05/20/22
<b>Lab Sample ID:</b>	JD45265-5	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	67.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2400	14	mg/kg	5	05/26/22	05/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52478  
(2) Prep QC Batch: MP33120

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	AOI7 BH-22	<b>Date Sampled:</b>	05/20/22
<b>Lab Sample ID:</b>	JD45265-5A	<b>Date Received:</b>	05/20/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	67.2
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
BOD, 5 Day <sup>a</sup>	4970	63	mg/kg	1	05/21/22 22:50	DB	SM5210 B-11 M
Chemical Oxygen Demand	139000	2900	mg/kg	1	05/27/22 13:08	MK	SM5220C11M,HACH8000M
Total Organic Carbon	67600	150	mg/kg	1	05/27/22 16:40	MB	LLOYD KAHN 1988 MOD

(a) Analysis done out of holding time.

RL = Reporting Limit

4.10  
4

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Certification Exceptions
- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

Parameter Certification Exceptions

Job Number: JD45265  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
BOD, 5 Day		SM5210 B-11 M	SO	SGS is not certified for this parameter. <sup>a</sup>

(a) Lab cert for analyte not supported by NJDEP, OQA. Only methods/analytes required for reporting by the State of NJ can be certified in NJ. Use of this analyte for compliance must be verified through the appropriate regulatory office.

Certification exceptions shown are based on the New Jersey DEP certifications. Applicability in other states may vary. Please contact your laboratory representative if additional information is required for a specific regulatory program.

5.1  
5

50

JD45265

E

SGS		CHAIN OF CUSTODY		Page 1 of 1	
SGS North America Inc. - Dayton 2235 Route 130, Dayton, NJ 08810 TEL. 732-329-0200 FAX 732-329-3499		FED-EX Tracking # SGS Quote # 2022 544		Bottle Order Control # None	
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook		Matrix Codes	
Street Address 1015 Virginia Dr, Suite 100		Street 100 Green Street		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED- Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank	
City State Zip Fort Washington, PA, 19034		City State Marcus Hook, PA 19061			
Project Contact Shana Whitney ewhitney@sanbornhead.com		Billing Information (if different from Report to) Company Name Sanborn Head & Associates			
Phone # 603-415-6159		Project # 4862.D4			
Sampler(s) Name(s)		Client Purchase Order #			
Project Manager Chelsey Shepsko		Street Address 20 Foundry Street		City State Zip Concord, NH, 03301	
Lab Sample #		Collection Date Time		Matrix	
Field ID / Point of Collection		MECHORDI Val #		# of bottles	
1 MW-360D 15-25'		5/19/2022 14:15		MDL SO	
2 MW-608D 14-28'		5/19/2022 16:15		MDL SO	
3 MW-608D 28-36'		5/19/2022 16:45		MDL SO	
4 MW-609D 23-33'		05/19/22 17:30		MDL SO	
5 AO 17 BH-22		5/20/2022 7:30		MDL SO	
Turnaround Time (Business days)		Approved by (SGS Project Manager) Date:		Data Deliverable Information	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink		Commercial "A" (Level 1) Commercial "B" (Level 2) X FULLT1 (Level 3+4) NJ Reduced X EDO Format SHA & Statex EQUS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		NYASP Category A NYASP Category B State Forms Other _____ Comments / Special Instructions	
Sample Custody must be documented below each time samples change possession, including courier delivery.					
Received by: <i>[Signature]</i>	Date Time: 5-20-22	Received by: <i>[Signature]</i>	Date Time: 5-20-22	Received by: <i>[Signature]</i>	Date Time: 5-20-22
Relinquished by: <i>[Signature]</i>	Date Time:	Relinquished by: <i>[Signature]</i>	Date Time:	Relinquished by: <i>[Signature]</i>	Date Time:
Received by: <i>[Signature]</i>	Date Time:	Received by: <i>[Signature]</i>	Date Time:	Received by: <i>[Signature]</i>	Date Time:
Relinquished by: <i>[Signature]</i>	Date Time:	Relinquished by: <i>[Signature]</i>	Date Time:	Relinquished by: <i>[Signature]</i>	Date Time:
Intact Not Intact Preserved where applicable On Ice On Ice Cooler Temp.					

JD45265: Chain of Custody

Page 1 of 3

## SGS Sample Receipt Summary

Job Number: JD45265

Client: \_\_\_\_\_

Project: \_\_\_\_\_

Date / Time Received: 5/20/2022 5:15:00 PM

Delivery Method: \_\_\_\_\_

Airbill #s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (2.6);

Cooler Temps (Corrected) °C: Cooler 1: (2.3);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
Rev. Date 12/7/17

JD45265: Chain of Custody

Page 2 of 3

Job Change Order: JD45265

<b>Requested Date:</b>	5/23/2022	<b>Received Date:</b>	5/20/2022
<b>Account Name:</b>	Sunoco/Evergreen	<b>Due Date:</b>	5/23/2022
<b>Project Description:</b>	SANHPAFW: Marcus Hook, PA	<b>Deliverable:</b>	REDT2
<b>C/O Initiated By:</b>	VICKYP	<b>PM:</b>	VP
		<b>TAT (Days):</b>	7

=====

<b>Sample #:</b>	JD45265-5	<b>Change:</b>	
<b>Dept:</b>			Revise ID to AO17 BH-22
<b>TAT:</b>	7		
	AO 17 BH-22		

=====

**Above Changes Per:** Shana Whitney      **Date/Time:** 5/23/2022

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD45265

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD45265-1 Collected: 19-MAY-22 14:15 By: MDL Received: 20-MAY-22 By: DG MW-360D 15-25'						
JD45265-1	SM2540 G 18TH ED M	20-MAY-22 16:27	BG			SOL104
JD45265-1	SW846 6010D	27-MAY-22 09:20	ND	26-MAY-22 AK		AS
JD45265-2 Collected: 19-MAY-22 16:15 By: MDL Received: 20-MAY-22 By: DG MW-608D 14-28'						
JD45265-2	SM2540 G 18TH ED M	20-MAY-22 16:27	BG			SOL104
JD45265-2	SW846 6010D	27-MAY-22 10:14	ND	26-MAY-22 AK		AS
JD45265-3 Collected: 19-MAY-22 16:45 By: MDL Received: 20-MAY-22 By: DG MW-608D 28-36'						
JD45265-3	SM2540 G 18TH ED M	20-MAY-22 16:27	BG			SOL104
JD45265-3	SW846 6010D	27-MAY-22 10:19	ND	26-MAY-22 AK		AS
JD45265-4 Collected: 19-MAY-22 17:30 By: MDL Received: 20-MAY-22 By: DG MW-609D 23-33'						
JD45265-4	SM2540 G 18TH ED M	20-MAY-22 16:27	BG			SOL104
JD45265-4	SW846 6010D	27-MAY-22 09:59	ND	26-MAY-22 AK		AS
JD45265-5 Collected: 20-MAY-22 07:30 By: MDL Received: 20-MAY-22 By: DG AOI7 BH-22						
JD45265-5	SM2540 G 18TH ED M	20-MAY-22 16:27	BG			SOL104
JD45265-5	SW846 6010D	27-MAY-22 10:24	ND	26-MAY-22 AK		AS
JD45265-1ACollected: 19-MAY-22 14:15 By: MDL Received: 20-MAY-22 By: DG MW-360D 15-25'						
JD45265-1A	SM5210 B-11 M	21-MAY-22 22:43	DB	21-MAY-22 DB		BOD
JD45265-1A	ALLOYD KAHN 1988 M	27-MAY-22 10:34	MB	24-MAY-22 NA		TOCLK
JD45265-1A	SM5220C11M,HACH800	27-MAY-22 13:08	MK	27-MAY-22 MK		COD
JD45265-2ACollected: 19-MAY-22 16:15 By: MDL Received: 20-MAY-22 By: DG MW-608D 14-28'						



Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD45265

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD45265-2ASM5210 B-11 M		21-MAY-22 22:45	DB	21-MAY-22 DB		BOD
JD45265-2ASM5220C11M,HACH8000		27-MAY-22 13:08	MK	27-MAY-22 MK		COD
JD45265-2ALLOYD KAHN 1988 MW-608D		24-MAY-22 14:42	MB	24-MAY-22 NA		TOCLK
JD45265-3ACollected: 19-MAY-22 16:45 By: MDL Received: 20-MAY-22 By: DG MW-608D 28-36'						
JD45265-3ASM5210 B-11 M		21-MAY-22 22:47	DB	21-MAY-22 DB		BOD
JD45265-3ALLOYD KAHN 1988 MW-609D		24-MAY-22 11:22	MB	24-MAY-22 NA		TOCLK
JD45265-3ASM5220C11M,HACH8000		27-MAY-22 13:08	MK	27-MAY-22 MK		COD
JD45265-4ACollected: 19-MAY-22 17:30 By: MDL Received: 20-MAY-22 By: DG MW-609D 23-33'						
JD45265-4ASM5210 B-11 M		21-MAY-22 22:48	DB	21-MAY-22 DB		BOD
JD45265-4ASM5220C11M,HACH8000		27-MAY-22 13:08	MK	27-MAY-22 MK		COD
JD45265-4ALLOYD KAHN 1988 MW-609D		24-MAY-22 16:23	MB	24-MAY-22 NA		TOCLK
JD45265-5ACollected: 20-MAY-22 07:30 By: MDL Received: 20-MAY-22 By: DG AOI7 BH-22						
JD45265-5ASM5210 B-11 M		21-MAY-22 22:50	DB	21-MAY-22 DB		BOD
JD45265-5ASM5220C11M,HACH8000		27-MAY-22 13:08	MK	27-MAY-22 MK		COD
JD45265-5ALLOYD KAHN 1988 MW-609D		24-MAY-22 16:40	MB	24-MAY-22 NA		TOCLK

# SGS Internal Chain of Custody

Page 1 of 3

**Job Number:** JD45265  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/20/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45265-1.1	Secured Storage	Daniel Broche	05/21/22 23:01	Retrieve from Storage
JD45265-1.1	Daniel Broche	Secured Storage	05/21/22 23:01	Return to Storage
JD45265-1.1	Secured Storage	Dave Hunkele	05/24/22 14:45	Retrieve from Storage
JD45265-1.1	Dave Hunkele	Secured Staging Area	05/24/22 14:45	Return to Storage
JD45265-1.1	Secured Staging Area	Naomi Altenbur	05/24/22 15:31	Retrieve from Storage
JD45265-1.1	Naomi Altenbur	Secured Storage	05/24/22 16:28	Return to Storage
JD45265-1.1	Secured Storage	Joshua Reitan	05/26/22 00:33	Retrieve from Storage
JD45265-1.1	Joshua Reitan	Secured Staging Area	05/26/22 00:33	Return to Storage
JD45265-1.1	Secured Staging Area	Alyssa Koshy	05/26/22 08:20	Retrieve from Storage
JD45265-1.1	Secured Storage	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD45265-1.1	Benjamin Gaines	Secured Staging Area	05/26/22 10:52	Return to Storage
JD45265-1.1	Secured Staging Area	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
JD45265-1.1	Benjamin Gaines	Secured Storage	05/26/22 16:36	Return to Storage
JD45265-1.1.1	Alyssa Koshy	Metals Digestion	05/26/22 10:29	Digestate from JD45265-1.1
JD45265-1.1.1	Metals Digestion	Alyssa Koshy	05/26/22 10:30	Digestate from JD45265-1.1
JD45265-1.1.1	Alyssa Koshy	Metals Digestate Storage	05/26/22 10:30	Return to Storage
JD45265-2.1	Secured Storage	Daniel Broche	05/21/22 23:01	Retrieve from Storage
JD45265-2.1	Daniel Broche	Secured Storage	05/21/22 23:01	Return to Storage
JD45265-2.1	Secured Storage	Dave Hunkele	05/24/22 14:45	Retrieve from Storage
JD45265-2.1	Dave Hunkele	Secured Staging Area	05/24/22 14:45	Return to Storage
JD45265-2.1	Secured Staging Area	Naomi Altenbur	05/24/22 15:31	Retrieve from Storage
JD45265-2.1	Naomi Altenbur	Secured Storage	05/24/22 16:28	Return to Storage
JD45265-2.1	Secured Storage	Joshua Reitan	05/26/22 00:33	Retrieve from Storage
JD45265-2.1	Joshua Reitan	Secured Staging Area	05/26/22 00:33	Return to Storage
JD45265-2.1	Secured Staging Area	Alyssa Koshy	05/26/22 08:20	Retrieve from Storage
JD45265-2.1	Secured Storage	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD45265-2.1	Benjamin Gaines	Secured Staging Area	05/26/22 10:52	Return to Storage
JD45265-2.1	Secured Staging Area	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
JD45265-2.1	Benjamin Gaines	Secured Storage	05/26/22 16:36	Return to Storage
JD45265-2.1.1	Alyssa Koshy	Metals Digestion	05/26/22 10:29	Digestate from JD45265-2.1
JD45265-2.1.1	Metals Digestion	Alyssa Koshy	05/26/22 10:30	Digestate from JD45265-2.1
JD45265-2.1.1	Alyssa Koshy	Metals Digestate Storage	05/26/22 10:30	Return to Storage
JD45265-3.1	Secured Storage	Daniel Broche	05/21/22 23:01	Retrieve from Storage
JD45265-3.1	Daniel Broche	Secured Storage	05/21/22 23:01	Return to Storage
JD45265-3.1	Secured Storage	Dave Hunkele	05/24/22 14:45	Retrieve from Storage
JD45265-3.1	Dave Hunkele	Secured Staging Area	05/24/22 14:45	Return to Storage
JD45265-3.1	Secured Staging Area	Naomi Altenbur	05/24/22 15:31	Retrieve from Storage
JD45265-3.1	Naomi Altenbur	Secured Storage	05/24/22 16:28	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD45265  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/20/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45265-3.1	Secured Storage	Joshua Reitan	05/26/22 00:33	Retrieve from Storage
JD45265-3.1	Joshua Reitan	Secured Staging Area	05/26/22 00:33	Return to Storage
JD45265-3.1	Secured Staging Area	Alyssa Koshy	05/26/22 08:20	Retrieve from Storage
JD45265-3.1	Secured Storage	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD45265-3.1	Benjamin Gaines	Secured Staging Area	05/26/22 10:52	Return to Storage
JD45265-3.1	Secured Staging Area	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
JD45265-3.1	Benjamin Gaines	Secured Storage	05/26/22 16:36	Return to Storage
JD45265-3.1.1	Alyssa Koshy	Metals Digestion	05/26/22 10:29	Digestate from JD45265-3.1
JD45265-3.1.1	Metals Digestion	Alyssa Koshy	05/26/22 10:30	Digestate from JD45265-3.1
JD45265-3.1.1	Alyssa Koshy	Metals Digestate Storage	05/26/22 10:30	Return to Storage
JD45265-4.1	Secured Storage	Daniel Broche	05/21/22 23:01	Retrieve from Storage
JD45265-4.1	Daniel Broche	Secured Storage	05/21/22 23:01	Return to Storage
JD45265-4.1	Secured Storage	Dave Hunkele	05/24/22 14:45	Retrieve from Storage
JD45265-4.1	Dave Hunkele	Secured Staging Area	05/24/22 14:45	Return to Storage
JD45265-4.1	Secured Staging Area	Naomi Altenbur	05/24/22 15:31	Retrieve from Storage
JD45265-4.1	Naomi Altenbur	Secured Storage	05/24/22 16:28	Return to Storage
JD45265-4.1	Secured Storage	Joshua Reitan	05/26/22 00:33	Retrieve from Storage
JD45265-4.1	Joshua Reitan	Secured Staging Area	05/26/22 00:33	Return to Storage
JD45265-4.1	Secured Staging Area	Alyssa Koshy	05/26/22 08:20	Retrieve from Storage
JD45265-4.1	Secured Storage	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD45265-4.1	Benjamin Gaines	Secured Staging Area	05/26/22 10:52	Return to Storage
JD45265-4.1	Secured Staging Area	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
JD45265-4.1	Benjamin Gaines	Secured Storage	05/26/22 16:36	Return to Storage
JD45265-4.1.1	Alyssa Koshy	Metals Digestion	05/26/22 10:29	Digestate from JD45265-4.1
JD45265-4.1.1	Metals Digestion	Alyssa Koshy	05/26/22 10:30	Digestate from JD45265-4.1
JD45265-4.1.1	Alyssa Koshy	Metals Digestate Storage	05/26/22 10:30	Return to Storage
JD45265-5.1	Secured Storage	Daniel Broche	05/21/22 23:01	Retrieve from Storage
JD45265-5.1	Daniel Broche	Secured Storage	05/21/22 23:01	Return to Storage
JD45265-5.1	Secured Storage	Dave Hunkele	05/24/22 14:45	Retrieve from Storage
JD45265-5.1	Dave Hunkele	Secured Staging Area	05/24/22 14:45	Return to Storage
JD45265-5.1	Secured Staging Area	Naomi Altenbur	05/24/22 15:31	Retrieve from Storage
JD45265-5.1	Naomi Altenbur	Secured Storage	05/24/22 16:28	Return to Storage
JD45265-5.1	Secured Storage	Joshua Reitan	05/26/22 00:33	Retrieve from Storage
JD45265-5.1	Joshua Reitan	Secured Staging Area	05/26/22 00:33	Return to Storage
JD45265-5.1	Secured Staging Area	Alyssa Koshy	05/26/22 08:20	Retrieve from Storage
JD45265-5.1	Secured Storage	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD45265-5.1	Benjamin Gaines	Secured Staging Area	05/26/22 10:52	Return to Storage

## SGS Internal Chain of Custody

Page 3 of 3

**Job Number:** JD45265  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/20/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45265-5.1	Secured Staging Area	Benjamin Gaines	05/26/22 10:52	Retrieve from Storage
JD45265-5.1	Benjamin Gaines	Secured Storage	05/26/22 16:36	Return to Storage
JD45265-5.1.1	Alyssa Koshy	Metals Digestion	05/26/22 10:29	Digestate from JD45265-5.1
JD45265-5.1.1	Metals Digestion	Alyssa Koshy	05/26/22 10:30	Digestate from JD45265-5.1
JD45265-5.1.1	Alyssa Koshy	Metals Digestate Storage	05/26/22 10:30	Return to Storage

5.4

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## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
Analyst: ND Run ID: MA52478  
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:14	MA52478-STD1	1		STDA
07:21	MA52478-STD2	1		STDB
07:26	MA52478-ICV1	1		
07:33	MA52478-ICB1	1		
07:39	MA52478-CCV1	1		
07:44	MA52478-CCB1	1		
07:49	MA52478-CRI1	1		
07:54	MA52478-CRID1	1		
07:59	MA52478-ICSA1	1		
08:04	MA52478-ICSAB1	1		
08:09	MA52478-HSTD1	1		
08:14	MA52478-HSTD2	1		
08:19	ZZZZZZ	1		
08:25	ZZZZZZ	1		
08:30	ZZZZZZ	1		
08:35	MA52478-CCV2	1		
08:40	MA52478-CCB2	1		
08:45	MP33120-MB1	1		
08:50	MP33120-B1	1		
08:55	MP33120-S1	1		
09:00	MP33120-S2	1		
09:05	JD45265-4	1		
09:10	MP33120-SD1	5		
09:15	MP33120-PS1	1		
09:20	JD45265-1	1		
09:25	JD45265-2	1		
09:30	MA52478-CCV3	1		
09:35	MA52478-CCB3	1		
09:40	JD45265-3	1		
09:45	JD45265-5	1		
09:50	MP33120-S1	10		CD, neg, Tl hit
09:55	MP33120-S2	10		CD, neg, Tl hit
09:59	JD45265-4	10		CD neg, Tl hit

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
Analyst: ND Run ID: MA52478  
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:04	MP33120-SD1	50		CD neg, Tl hit
10:09	MP33120-PS1	10		
10:14	JD45265-2	5		
10:19	JD45265-3	20		
10:24	JD45265-5	5		
----->	Last reportable sample/prep for job JD45265			
10:29	MA52478-CCV4	1		
10:34	MA52478-CCB4	1		
10:39	MA52478-CRI2	1		
10:45	MA52478-ICSA2	1		
10:50	MA52478-ICSAB2	1		
10:54	MA52478-CCV5	1		
10:59	MA52478-CCB5	1		
----->	Last reportable CCB for job JD45265			
11:05	MP33048-MB1	1		
11:10	MP33048-LB1	1		
11:15	MP33048-B1	1		
11:20	MP33048-LS1	1		
11:25	MP33048-S1	1		
11:29	MP33048-S2	1		
11:34	JD44036-1R	1		(sample used for QC only; not part of login JD45265)
11:39	MP33048-SD1	5		
11:45	ZZZZZZ	1		
11:50	MA52478-CCV6	1		
11:54	MA52478-CCB6	1		
12:00	ZZZZZZ	1		
12:05	ZZZZZZ	1		
12:10	ZZZZZZ	1		
12:15	ZZZZZZ	1		
12:21	ZZZZZZ	1		
12:26	MA52478-CCV7	1		
12:31	MA52478-CCB7	1		
12:36	MP33119-MB1	1		
12:41	MP33119-LB1	1		
12:46	MP33119-B1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
Analyst: ND      Run ID: MA52478  
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:51	MP33119-LS1	1		
12:56	MP33119-S1	1		
13:01	MP33119-S2	1		
13:06	JD45081-20	1		(sample used for QC only; not part of login JD45265)
13:11	MP33119-SD1	5		
13:16	ZZZZZZ	1		
13:21	ZZZZZZ	1		
13:26	MA52478-CCV8	1		
13:31	MA52478-CCB8	1		
13:36	ZZZZZZ	1		
13:41	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:52	ZZZZZZ	1		
13:57	ZZZZZZ	1		
14:02	ZZZZZZ	1		
14:07	ZZZZZZ	1		
14:12	ZZZZZZ	1		
14:17	ZZZZZZ	1		
14:22	MA52478-CCV9	1		
14:27	MA52478-CCB9	1		
14:32	ZZZZZZ	1		
14:37	ZZZZZZ	1		
14:43	ZZZZZZ	1		
14:48	ZZZZZZ	1		
14:53	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52478-CCV10	1		
15:13	MA52478-CCB10	1		
15:18	ZZZZZZ	1		
15:24	ZZZZZZ	1		
15:29	ZZZZZZ	1		
15:34	ZZZZZZ	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
Analyst: ND      Run ID: MA52478  
Parameters: As

Time	Sample Description	Dilution PS		Comments
		Factor	Recov	

15:39 ZZZZZZ 1

15:45 ZZZZZZ 1

Refer to raw data for calibration curve and standards.

6.1

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## REPORTED ELEMENTS SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22      Methods: SW846 6010D  
Run ID: MA52478

Time	Sample Description	Element: A Dilution s
07:26	MA52478-ICV1	1 X
07:33	MA52478-ICB1	1 X
07:39	MA52478-CCV1	1 X
07:44	MA52478-CCB1	1 X
07:49	MA52478-CRI1	1 X
07:54	MA52478-CRID1	1 X
07:59	MA52478-ICSA1	1 X
08:04	MA52478-ICSAB1	1 X
08:09	MA52478-HSTD1	1 X
08:14	MA52478-HSTD2	1 X
08:19	ZZZZZZ	1
08:25	ZZZZZZ	1
08:30	ZZZZZZ	1
08:35	MA52478-CCV2	1 X
08:40	MA52478-CCB2	1 X
08:45	MP33120-MB1	1 X
08:50	MP33120-B1	1 X
08:55	MP33120-S1	1
09:00	MP33120-S2	1
09:05	JD45265-4	1
09:10	MP33120-SD1	5
09:15	MP33120-PS1	1
09:20	JD45265-1	1 X
09:25	JD45265-2	1
09:30	MA52478-CCV3	1 X
09:35	MA52478-CCB3	1 X
09:40	JD45265-3	1
09:45	JD45265-5	1
09:50	MP33120-S1	10 X
09:55	MP33120-S2	10 X
09:59	JD45265-4	10 X
10:04	MP33120-SD1	50 X
10:09	MP33120-PS1	10
		Element: A s

## REPORTED ELEMENTS SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22      Methods: SW846 6010D  
Run ID: MA52478

Time	Sample Description	Element: A Dilution s
10:14	JD45265-2	5 X
10:19	JD45265-3	20 X
10:24	JD45265-5	5 X
10:29	MA52478-CCV4	1 X
10:34	MA52478-CCB4	1 X
10:39	MA52478-CRI2	1 X
10:45	MA52478-ICSA2	1 X
10:50	MA52478-ICSAB2	1 X
10:54	MA52478-CCV5	1 X
10:59	MA52478-CCB5	1 X
11:05	MP33048-MB1	1
11:10	MP33048-LB1	1
11:15	MP33048-B1	1
11:20	MP33048-LS1	1
11:25	MP33048-S1	1
11:29	MP33048-S2	1
11:34	JD44036-1R	1 (a)
11:39	MP33048-SD1	5
11:45	ZZZZZZ	1
11:50	MA52478-CCV6	1 X
11:54	MA52478-CCB6	1 X
12:00	ZZZZZZ	1
12:05	ZZZZZZ	1
12:10	ZZZZZZ	1
12:15	ZZZZZZ	1
12:21	ZZZZZZ	1
12:26	MA52478-CCV7	1 X
12:31	MA52478-CCB7	1 X
12:36	MP33119-MB1	1
12:41	MP33119-LB1	1
12:46	MP33119-B1	1
12:51	MP33119-LS1	1
12:56	MP33119-S1	1
		Element: A s

REPORTED ELEMENTS SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22 Methods: SW846 6010D  
Run ID: MA52478

Time	Sample Description	Element: A Dilution s
13:01	MP33119-S2	1
13:06	JD45081-20	1 (a)
13:11	MP33119-SD1	5
13:16	ZZZZZZ	1
13:21	ZZZZZZ	1
13:26	MA52478-CCV8	1 X
13:31	MA52478-CCB8	1 X
13:36	ZZZZZZ	1
13:41	ZZZZZZ	1
13:46	ZZZZZZ	1
13:52	ZZZZZZ	1
13:57	ZZZZZZ	1
14:02	ZZZZZZ	1
14:07	ZZZZZZ	1
14:12	ZZZZZZ	1
14:17	ZZZZZZ	1
14:22	MA52478-CCV9	1 X
14:27	MA52478-CCB9	1 X
14:32	ZZZZZZ	1
14:37	ZZZZZZ	1
14:43	ZZZZZZ	1
14:48	ZZZZZZ	1
14:53	ZZZZZZ	1
14:58	ZZZZZZ	1
15:03	ZZZZZZ	1
15:08	MA52478-CCV10	1 X
15:13	MA52478-CCB10	1 X
15:18	ZZZZZZ	1
15:24	ZZZZZZ	1
15:29	ZZZZZZ	1
15:34	ZZZZZZ	1
15:39	ZZZZZZ	1
15:45	ZZZZZZ	1
		Element: A s

REPORTED ELEMENTS SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
Analyst: ND      Run ID: MA52478  
Parameters: As

Sample		Element: A
Time	Description	Dilution s

(a) Sample used for QC only; not part of login JD45265.

Element: A  
s

## INTERNAL STANDARD SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22  
Run ID: MA52478  
Methods: SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:14	MA52478-STD1	3762 R	123520 R	8531 R	9198 R
07:21	MA52478-STD2	3608	117700	8207	8715
07:26	MA52478-ICV1	3652	118460	8283	8797
07:33	MA52478-ICB1	3759	122020	8259	9182
07:39	MA52478-CCV1	3701	120260	8504	8908
07:44	MA52478-CCB1	3788	123250	8396	9265
07:49	MA52478-CRI1	3755	122900	8332	9159
07:54	MA52478-CRID1	3777	124310	8598	9231
07:59	MA52478-ICSA1	3442	111170	8089	8265
08:04	MA52478-ICSAB1	3414	112210	8338	8231
08:09	MA52478-HSTD1	3731	122470	8349	9299
08:14	MA52478-HSTD2	3470	113500	8241	8260
08:19	ZZZZZZ	3796	124090	8702	9479
08:25	ZZZZZZ	3768	125420	8644	9339
08:30	ZZZZZZ	3780	122910	8519	9254
08:35	MA52478-CCV2	3687	120700	8542	8887
08:40	MA52478-CCB2	3779	124160	8517	9244
08:45	MP33120-MB1	3784	125070	8678	9240
08:50	MP33120-B1	3729	121790	8581	9030
08:55	MP33120-S1	3778	123840	9140	8702
09:00	MP33120-S2	3838	125720	9191	8820
09:05	JD45265-4	3842	127590	9211	8821
09:10	MP33120-SD1	3777	124090	8765	9024
09:15	MP33120-PS1	3811	126200	9187	8741
09:20	JD45265-1	3987	129050	9285	9195
09:25	JD45265-2	3813	125650	9092	9048
09:30	MA52478-CCV3	3776	122420	8580	8921
09:35	MA52478-CCB3	3854	126740	8676	9215
09:40	JD45265-3	3944	130280	9284	8832
09:45	JD45265-5	3923	129460	9255	9028
09:50	MP33120-S1	3897	126730	8813	9141
09:55	MP33120-S2	3854	126850	8817	9031
09:59	JD45265-4	3887	127470	8843	9110

## INTERNAL STANDARD SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22  
Run ID: MA52478  
Methods: SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:04	MP33120-SD1	3912	128260	8801	9237
10:09	MP33120-PS1	3812	127500	8927	8940
10:14	JD45265-2	3857	127840	8936	9059
10:19	JD45265-3	3809	127370	8812	8951
10:24	JD45265-5	3947	129020	9014	9176
10:29	MA52478-CCV4	3772	123930	8683	8795
10:34	MA52478-CCB4	3935	129270	8763	9256
10:39	MA52478-CRI2	3873	127970	8844	9115
10:45	MA52478-ICSA2	3547	116910	8585	8244
10:50	MA52478-ICSAB2	3556	116730	8546	8256
10:54	MA52478-CCV5	3890	125820	8742	9027
10:59	MA52478-CCB5	3898	128520	8756	9206
11:05	MP33048-MB1	3904	129750	8887	9212
11:10	MP33048-LB1	3921	130240	8816	9275
11:15	MP33048-B1	3859	127440	8876	9010
11:20	MP33048-LS1	3877	128230	8965	9043
11:25	MP33048-S1	3867	128570	9050	8954
11:29	MP33048-S2	3906	128210	9075	9050
11:34	JD44036-1R	3960	131310	9158	9187
11:39	MP33048-SD1	3976	130970	9018	9299
11:45	ZZZZZZ	3933	130540	9091	9200
11:50	MA52478-CCV6	3893	127670	8926	9023
11:54	MA52478-CCB6	3972	131430	8888	9348
12:00	ZZZZZZ	3960	132070	9115	9291
12:05	ZZZZZZ	3987	131920	9085	9343
12:10	ZZZZZZ	10331 !	311410 !	17157 !	23718 !
12:15	ZZZZZZ	10316 !	314020 !	17037 !	23691 !
12:21	ZZZZZZ	10473 !	312060 !	17013 !	24017 !
12:26	MA52478-CCV7	3935	129190	9005	9103
12:31	MA52478-CCB7	4033	133870	9095	9479
12:36	MP33119-MB1	4025	133750	9186	9453
12:41	MP33119-LB1	4070	135580	9259	9579
12:46	MP33119-B1	3974	133440	9333	9262

## INTERNAL STANDARD SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 05/27/22      Methods: SW846 6010D  
Run ID: MA52478

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:51	MP33119-LS1	4036	133500	9314	9376
12:56	MP33119-S1	4063	134070	9424	9438
13:01	MP33119-S2	4063	134290	9478	9424
13:06	JD45081-20	4138	137030	9496	9676
13:11	MP33119-SD1	4155	138320	9447	9745
13:16	ZZZZZZ	4092	137760	9543	9598
13:21	ZZZZZZ	4150	137820	9501	9727
13:26	MA52478-CCV8	4090	133800	9384	9446
13:31	MA52478-CCB8	4203	138180	9437	9858
13:36	ZZZZZZ	4120	136800	9506	9507
13:41	ZZZZZZ	4089	135990	9538	9452
13:46	ZZZZZZ	4034	134220	9432	9211
13:52	ZZZZZZ	4096	138150	9623	9455
13:57	ZZZZZZ	4144	138070	9607	9555
14:02	ZZZZZZ	4118	136440	9602	9370
14:07	ZZZZZZ	4228	141280	9790	9849
14:12	ZZZZZZ	4250	140640	9805	9850
14:17	ZZZZZZ	4259	140460	9806	9823
14:22	MA52478-CCV9	4173	138180	9756	9605
14:27	MA52478-CCB9	4307	142550	9767	10069
14:32	ZZZZZZ	4318	143040	9946	10092
14:37	ZZZZZZ	4283	141300	9933	9996
14:43	ZZZZZZ	4191	141690	9923	9738
14:48	ZZZZZZ	4283	142460	9890	10006
14:53	ZZZZZZ	4334	144200	9983	10118
14:58	ZZZZZZ	4271	142550	9902	9847
15:03	ZZZZZZ	4197	138820	9806	9537
15:08	MA52478-CCV10	4300	140210	9895	9881
15:13	MA52478-CCB10	4427	144940	9948	10320
15:18	ZZZZZZ	4431	145420	9961	10319
15:24	ZZZZZZ	4463	146080	9992	10408
15:29	ZZZZZZ	4459	145810	9957	10398
15:34	ZZZZZZ	4369	145580	10053	10251



# INTERNAL STANDARD SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
 Analyst: ND Run ID: MA52478  
 Parameters: As

Sample					
Time	Description	Istd#1	Istd#2	Istd#3	Istd#4
15:39	ZZZZZZ	4343	145580	10032	10166
15:45	ZZZZZZ	4387	146080	9988	10261

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

6.1.2

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52478 Units: ug/l

Time: Sample ID:			07:33 ICB1		07:44 CCB1		08:40 CCB2		09:35 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	9.2	anr							
Antimony	20	2.8	anr							
Arsenic	20	2.6	0.200	<20	0.400	<20	0.600	<20	1.20	<20
Barium	200	.2	anr							
Beryllium	2.0	.2	anr							
Bismuth	20	2.5								
Boron	100	1.8								
Cadmium	4.0	.4	anr							
Calcium	5000	13								
Chromium	10	.7	anr							
Cobalt	50	.6	anr							
Copper	10	.7	anr							
Iron	100	3.3	anr							
Lead	20	2	anr							
Lithium	50	1.5								
Magnesium	5000	25	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.8	anr							
Phosphorus	50	7								
Potassium	10000	35	anr							
Selenium	20	3.6	anr							
Silicon	200	2.2								
Silver	5.0	.6	anr							
Sodium	10000	14	anr							
Strontium	10	.1								
Sulfur	50	3.7								
Thallium	10	5.2	anr							
Tin	10	1.4								
Titanium	10	.8								
Tungsten	50	1.3								
Vanadium	50	.5	anr							
Zinc	20	.3	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: result < RL      Run ID: MA52478      Units: ug/l

Time:		07:33		07:44		08:40		09:35		
Sample ID:		ICB1		CCB1		CCB2		CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final

Zirconium      10      .5

(\*) Outside of QC limits  
(anr) Analyte not requested



6.1.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52478 Units: ug/l

Time: Sample ID:			10:34 CCB4		10:59 CCB5	
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	9.2	anr			
Antimony	20	2.8	anr			
Arsenic	20	2.6	1.00	<20	1.10	<20
Barium	200	.2	anr			
Beryllium	2.0	.2	anr			
Bismuth	20	2.5				
Boron	100	1.8				
Cadmium	4.0	.4	anr			
Calcium	5000	13				
Chromium	10	.7	anr			
Cobalt	50	.6	anr			
Copper	10	.7	anr			
Iron	100	3.3	anr			
Lead	20	2	anr			
Lithium	50	1.5				
Magnesium	5000	25	anr			
Manganese	15	.1	anr			
Molybdenum	20	.6				
Nickel	10	.8	anr			
Phosphorus	50	7				
Potassium	10000	35	anr			
Selenium	20	3.6	anr			
Silicon	200	2.2				
Silver	5.0	.6	anr			
Sodium	10000	14	anr			
Strontium	10	.1				
Sulfur	50	3.7				
Thallium	10	5.2	anr			
Tin	10	1.4				
Titanium	10	.8				
Tungsten	50	1.3				
Vanadium	50	.5	anr			
Zinc	20	.3	anr			

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: result < RL      Run ID: MA52478      Units: ug/l

Time:		10:34		10:59		
Sample ID:		CCB4		CCB5		
Metal	RL	IDL	raw	final	raw	final

Zirconium      10      .5

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.3  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52478      Units: ug/l

Time: Sample ID:		07:26 ICV1	% Rec	07:39 CCV1	% Rec	08:35 CCV2	% Rec
Metal	ICV	Results		True		True	
Aluminum	anr						
Antimony	anr						
Arsenic	2000	2080	104.0	2000	1980	99.0	2000
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	anr						
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						
Zinc	anr						

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52478      Units: ug/l

Time:		07:26			07:39			08:35		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52478      Units: ug/l

Time: Sample ID:		09:30 CCV3		10:29 CCV4		10:54 CCV5			
Metal	CCV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1930	96.5	2000	1890	94.5	2000	1870	93.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								
Zinc	anr								



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45265

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 05/27/22  
Run ID: MA52478

Methods: SW846 6010D  
Units: ug/l

		Time: 09:30		10:29		10:54	
Sample ID:	CCV	CCV3		CCV	CCV4	CCV	CCV5
Metal	True	Results % Rec		True	Results % Rec	True	Results % Rec

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

## HIGH STANDARD CHECK SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
QC Limits: 90 to 110 % Recovery Run ID: MA52478 Units: ug/l

Time:		08:09		08:14		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	anr					
Arsenic	8000	7630	95.4			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					

HIGH STANDARD CHECK SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52478      Units: ug/l

Time:		08:09		08:14		
Sample ID:		HSTD1		HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52478 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:49 CRI1		07:54 CRID1		10:39 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	8.40	105.0	3.30	110.0	9.20	115.0
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000						
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		anr					
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					
Zinc	20		10	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52478 Units: ug/l

Time:					07:49		07:54		10:39	
Sample ID:	CRI	CRIA	CRID	CRI1		CRID1		CRI2		
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.16  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP      Date Analyzed: 05/27/22      Methods: SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52478      Units: ug/l

Time: Sample ID:	ICSA	ICSAB	07:59 ICSAB1		08:04 ICSAB1		10:45 ICSAB2		10:50 ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	497000	99.4	497000	99.4	477000	95.4	481000	96.2
Antimony		1000	-0.600		1010	101.0	-2.20		938	93.8
Arsenic		1000	1.60		995	99.5	1.80		932	93.2
Barium		500	4.00		490	98.0	3.80		469	93.8
Beryllium		500	0.300		488	97.6	0.200		446	89.2
Bismuth		500	0.600		515	103.0	-2.90		519	103.8
Boron		500	2.60		504	100.8	1.20		485	97.0
Cadmium		1000	-0.600		1040	104.0	-1.00		1010	101.0
Calcium	400000	400000	392000	98.0	392000	98.0	367000	91.8	373000	93.3
Chromium		500	-1.10		478	95.6	-1.30		471	94.2
Cobalt		500	0.200		476	95.2	0.500		472	94.4
Copper		500	-0.700		534	106.8	-4.10		484	96.8
Iron	200000	200000	204000	102.0	199000	99.5	190000	95.0	187000	93.5
Lead		1000	1.90		947	94.7	1.30		925	92.5
Lithium		500	0.100		481	96.2	0.00		438	87.6
Magnesium	500000	500000	504000	100.8	495000	99.0	453000	90.6	453000	90.6
Manganese		500	2.10		509	101.8	-0.100		478	95.6
Molybdenum		500	3.00		480	96.0	2.60		451	90.2
Nickel		1000	0.700		928	92.8	1.90		951	95.1
Phosphorus		500	10.4		500	100.0	15.5		489	97.8
Potassium			24.2		19.8		-12.4		8.90	
Selenium		1000	1.30		931	93.1	7.50		940	94.0
Silicon		500	-12.2		508	101.6	-12.9		498	99.6
Silver		1000	3.10		1030	103.0	0.200		946	94.6
Sodium			21.4		28.6		7.10		5.00	
Strontium		500	-1.30		494	98.8	-1.30		446	89.2
Sulfur		500	30.9		532	106.4	32.1		496	99.2
Thallium		1000	4.10		955	95.5	-1.20		886	88.6
Tin		500	-3.50		476	95.2	-2.60		457	91.4
Titanium		500	-2.50		485	97.0	-2.30		514	102.8
Tungsten		500	-6.10		479	95.8	-5.00		470	94.0
Vanadium		500	4.20		502	100.4	7.30		465	93.0
Zinc		1000	7.20		956	95.6	6.50		910	91.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF052722M1.ICP Date Analyzed: 05/27/22 Methods: SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52478 Units: ug/l

Time:				07:59			08:04			10:45			10:50
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zirconium 500 5.00 442 88.4 2.40 441 88.2

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.7

6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/26/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	.92	8.1		
Antimony	2.0	.22	.41		
Arsenic	2.0	.13	.28	-0.030	<2.0
Barium	20	.02	1.9		
Beryllium	0.20	.02	.08		
Bismuth	2.0	.21	.52		
Boron	10	.1	3.7		
Cadmium	0.50	.02	.07		
Calcium	500	.77	21		
Chromium	1.0	.05	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.07	.84		
Iron	50	.33	19		
Lead	2.0	.16	.41		
Lithium	5.0	.15	.92		
Magnesium	500	2.5	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.05	.32		
Nickel	4.0	.03	.35		
Phosphorus	20	.18	3.3		
Potassium	1000	3.5	32		
Selenium	2.0	.2	.65		
Silicon	20	.13	11		
Silver	0.50	.06	.17		
Sodium	1000	1.4	78		
Strontium	5.0	.01	.18		
Sulfur	10	.37	3.9		
Thallium	1.0	.16	.58		
Tin	20	.09	3.8		
Titanium	1.0	.08	.34		
Tungsten	5.0	.13	1.8		
Vanadium	5.0	.05	.19		
Zinc	5.0	.02	2.3		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/26/22

Metal	RL	IDL	MDL	MB raw	final
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Zirconium 2.0 .05 .54

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/26/22

Metal	JD45265-4 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	6900	6670	296	-77.6(a) 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/26/22

Metal	JD45265-4 Original MS	Spike lot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

6.2.2

6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/26/22

Metal	JD45265-4 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	7030	8500	293	545.2(a)	24.1 (b) 20
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/26/22

Metal	JD45265-4 Original MSD	Spielot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) High rpd due to possible sample nonhomogeneity.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45265

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120

Methods: SW846 6010D

Matrix Type: SOLID

Units: mg/kg

Prep Date:

05/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	194	200	97.0	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.2.3

6

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/26/22

Metal		JD45265-4 Original SDL 1:5		%DIF	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	47900	48300	2.9	0-10	
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/26/22

Metal	JD45265-4		QC	
	Original	SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.2.4

6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

05/26/22

Metal	Sample ml	Final ml	JD45265-4 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Phosphorus										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Strontium										
Sulfur										
Thallium										
Tin										
Titanium										
Tungsten										
Vanadium										
Zinc										

POST DIGESTATE SPIKE SUMMARY

Login Number: JD45265  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33120  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

05/26/22

Metal	Sample ml	Final ml	JD45265-4 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Zirconium

Associated samples MP33120: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC
- Percent Solids Raw Data Summary

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
BOD, 5 Day	GP40242/GN29437	21	<21	mg/kg	198	180	90.9	85-115%
Chemical Oxygen Demand	GP40345/GN29682	20	0.0	mg/kg				
Chemical Oxygen Demand	GP40345/GN29682	20	0.0	mg/kg	150	147	98.0	90-110%
Chemical Oxygen Demand	GP40345/GN29682			mg/kg	750	798	106.4	90-110%
Total Organic Carbon	GP40279/GN29701	100	0.00	mg/kg	2000	1940	97.0	80-120%

Associated Samples:  
Batch GP40242: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A  
Batch GP40279: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A  
Batch GP40345: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A  
(\*) Outside of QC limits

7.1  
7

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
BOD, 5 Day	GP40242/GN29437	JD45265-1A	mg/kg	806	474	51.9*	0-20%
Chemical Oxygen Demand	GP40345/GN29682	JD45265-1A	mg/kg	48500	48500	0.0	0-33%
Solids, Percent	GN29622	JD45265-1	%	71.4	63.6	11.6* (a)	0-5%

Associated Samples:

Batch GN29622: JD45265-1, JD45265-2, JD45265-3, JD45265-4, JD45265-5

Batch GP40242: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A

Batch GP40345: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A

(\*) Outside of QC limits

(a) High RPD due to nature of sample matrix.

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chemical Oxygen Demand	GP40345/GN29682	JD45265-1A	mg/kg	48500	7000	85700	531.2(a)	75-125%
Total Organic Carbon	GP40279/GN29701	JD45265-2A	mg/kg	28600	52500	67500	74.1	14-161%

Associated Samples:

Batch GP40279: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A

Batch GP40345: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Total Organic Carbon	GP40279/GN29701	JD45265-2A	mg/kg	28600	54300	62900	7.1	

Associated Samples:  
Batch GP40279: JD45265-1A, JD45265-2A, JD45265-3A, JD45265-4A, JD45265-5A  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: E220526S1.TXT Date Analyzed: 05/26/22 Methods: LLOYD KAHN 1988 MOD  
Analyst: MB Run ID: GN29701  
Parameters: Total Organic Carbon

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:23	GN29701-STD1	1		STDA
16:55	GN29701-STD2	1		STDB
17:27	GN29701-STD3	1		STDC
17:53	GN29701-STD4	1		STDD
18:20	GN29701-STD5	1		STDE
18:50	GN29701-STD6	1		STDF
19:22	GN29701-STD7	1		STDG
10:39	GN29701-CRI1	1		
10:53	GN29701-HSTD1	1		
11:14	GN29701-ICV1	1		
11:27	GN29701-CCV1	1		
11:39	GP40279-MB1	1		
11:52	GP40279-B1	1		
12:04	GN29701-CCV2	1		
10:17	GN29701-CCV3	1		
10:34	JD45265-1A	1		
10:52	JD45265-2A	1		overrange, see rerun
11:02	GP40279-S1	1		overrange, see rerun
11:12	GP40279-MSD1	1		overrange, see rerun
11:22	JD45265-3A	1		
11:45	JD45265-4A	1		overrange, see rerun
12:06	JD45265-5A	1		overrange, see rerun
12:36	GN29701-CCV4	1		
12:47	GP40279-MB2	1		
12:58	GP40279-B2	1		
14:42	JD45265-2A	1		
15:16	GP40279-S1	1		
15:50	GP40279-MSD1	1		
16:23	JD45265-4A	1		
16:40	JD45265-5A	1		
16:56	GN29701-CCV5	1		

Refer to raw data for calibration curve and standards.

Instrument QC Summary  
Inorganics Analyses

Login Number: JD45265  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: E220526S1.TXT

Date Analyzed: 05/26/22  
Run ID: GN29701

Methods: LLOYD KAHN 1988 MOD  
Units: mg/l

Sample Number	Parameter	Result	RL	IDL/MDL	True Value	% Recov.	QC Limits
GN29701-CRI1	Total Organic Carbon	995	100	78	1000	99.5	70-130
GN29701-HSTD1	Total Organic Carbon	45200	100	78	50000	90.4	90-110
GN29701-ICV1	Total Organic Carbon	19500	100	78	20000	97.5	90-110
GN29701-CCV1	Total Organic Carbon	23200	100	78	25000	92.8	90-110
GN29701-CCV2	Total Organic Carbon	23000	100	78	25000	92.0	90-110
GN29701-CCV3	Total Organic Carbon	24200	100	78	25000	96.8	90-110
GN29701-CCV4	Total Organic Carbon	24400	100	78	25000	97.6	90-110
GN29701-CCV5	Total Organic Carbon	22600	100	78	25000	90.4	90-110

(!) Outside of QC limits

## Percent Solids Raw Data Summary

Page 1 of 1

**Job Number:** JD45265  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD45265-1      **Analyzed:** 26-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-360D 15-25'

Wet Weight (Total)	32.32	g
Tare Weight	24.97	g
Dry Weight (Total)	30.22	g
Solids, Percent	71.4	%

---

**Sample:** JD45265-2      **Analyzed:** 26-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D 14-28'

Wet Weight (Total)	24.85	g
Tare Weight	19.02	g
Dry Weight (Total)	23.73	g
Solids, Percent	80.8	%

---

**Sample:** JD45265-3      **Analyzed:** 26-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-608D 28-36'

Wet Weight (Total)	26.71	g
Tare Weight	21.41	g
Dry Weight (Total)	24.81	g
Solids, Percent	64.2	%

---

**Sample:** JD45265-4      **Analyzed:** 26-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** MW-609D 23-33'

Wet Weight (Total)	26.66	g
Tare Weight	18.79	g
Dry Weight (Total)	23.9	g
Solids, Percent	64.9	%

---

**Sample:** JD45265-5      **Analyzed:** 26-MAY-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** AOI7 BH-22

Wet Weight (Total)	29.39	g
Tare Weight	22.69	g
Dry Weight (Total)	27.19	g
Solids, Percent	67.2	%

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The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD45438

Sampling Date: 05/24/22



Report to:

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Total number of pages in report: **74**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD45438

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45438-1F	05/24/22	09:25 MF	05/24/22	AQ	Groundwater Filtered	MW-608D_20220524
JD45438-2F	05/24/22	12:00 MF	05/24/22	AQ	Groundwater Filtered	MW-609D_20220524

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45438

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/6/2022 10:35:49 AM

On 05/24/2022, 2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45438 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33185

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45438-2FMS, JD45438-2FMSD, JD45438-2FSDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JD45438  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 05/24/22



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						
JD45438-1F		MW-608D_20220524				
Arsenic		494000	600		ug/l	SW846 6010D
Iron		73600	100		ug/l	SW846 6010D
JD45438-2F		MW-609D_20220524				
Arsenic		633000	600		ug/l	SW846 6010D
Iron		108000	100		ug/l	SW846 6010D



Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220524	<b>Date Sampled:</b>	05/24/22
<b>Lab Sample ID:</b>	JD45438-1F	<b>Date Received:</b>	05/24/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	494000	600	ug/l	200	06/01/22	06/02/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	73600	100	ug/l	1	06/01/22	06/03/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52505
- (2) Instrument QC Batch: MA52515
- (3) Prep QC Batch: MP33185

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220524	<b>Date Sampled:</b>	05/24/22
<b>Lab Sample ID:</b>	JD45438-2F	<b>Date Received:</b>	05/24/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	633000	600	ug/l	200	06/01/22	06/02/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	108000	100	ug/l	1	06/01/22	06/03/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52505
- (2) Instrument QC Batch: MA52515
- (3) Prep QC Batch: MP33185

RL = Reporting Limit

4.2  
4

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

## 5.1

## SGS Sample Receipt Summary

**Job Number:** JD45438

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 5/24/2022 6:45:00 PM

**Delivery Method:**

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.0);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.7);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

**JD45438: Chain of Custody**

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Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD45438

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD45438-1F Collected: 24-MAY-22 09:25 By: MF Received: 24-MAY-22 By: DG MW-608D_20220524						
JD45438-1F SW846 6010D		02-JUN-22 08:34	ND	01-JUN-22	AK	AS
JD45438-1F SW846 6010D		03-JUN-22 15:36	ND	01-JUN-22	AK	FE
JD45438-2F Collected: 24-MAY-22 12:00 By: MF Received: 24-MAY-22 By: DG MW-609D_20220524						
JD45438-2F SW846 6010D		02-JUN-22 08:24	ND	01-JUN-22	AK	AS
JD45438-2F SW846 6010D		03-JUN-22 15:09	ND	01-JUN-22	AK	FE

# SGS Internal Chain of Custody

Page 1 of 1

**Job Number:** JD45438  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/24/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45438-1F.1	James Kwon	Secured Storage	05/25/22 18:49	Return to Storage
JD45438-1F.1	Secured Storage	Alyssa Koshy	05/28/22 12:28	Retrieve from Storage
JD45438-1F.1	Alyssa Koshy	Secured Storage	05/30/22 19:04	Return to Storage
JD45438-1F.1	Secured Storage	Alyssa Koshy	05/30/22 19:08	Retrieve from Storage
JD45438-1F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45438-1F.1	Secured Storage	Alyssa Koshy	05/31/22 14:13	Retrieve from Storage
JD45438-1F.1	Alyssa Koshy	Secured Storage	05/31/22 15:37	Return to Storage
JD45438-1F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 15:33	Digestate from JD45438-1F.1
JD45438-1F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 15:33	Digestate from JD45438-1F.1
JD45438-1F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 15:33	Return to Storage
JD45438-2F.1	James Kwon	Secured Storage	05/25/22 18:49	Return to Storage
JD45438-2F.1	Secured Storage	Alyssa Koshy	05/28/22 12:28	Retrieve from Storage
JD45438-2F.1	Alyssa Koshy	Secured Storage	05/30/22 19:04	Return to Storage
JD45438-2F.1	Secured Storage	Alyssa Koshy	05/30/22 19:08	Retrieve from Storage
JD45438-2F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45438-2F.1	Secured Storage	Alyssa Koshy	05/31/22 14:13	Retrieve from Storage
JD45438-2F.1	Alyssa Koshy	Secured Storage	05/31/22 15:37	Return to Storage
JD45438-2F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 15:33	Digestate from JD45438-2F.1
JD45438-2F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 15:33	Digestate from JD45438-2F.1
JD45438-2F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 15:33	Return to Storage



## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:37	MA52505-STD1	1		STDA
06:43	MA52505-STD2	1		STDB
06:48	MA52505-ICV1	1		
06:55	MA52505-ICB1	1		
07:01	MA52505-ICCV1	1		
07:12	MA52505-CCB1	1		
07:18	MA52505-CRI1	1		
07:23	MA52505-CRID1	1		
07:29	MA52505-ICSA1	1		
07:34	MA52505-ICSAB1	1		
07:38	MA52505-HSTD1	1		
07:44	MA52505-HSTD2	1		
07:49	MA52505-CRID2	1		
07:54	MP33185-B1	1		batch to rerun for Ag, Cu, SB,Be, CRI and ICSA out
07:59	MP33185-MB1	1		
08:04	MA52505-CCV1	1		
08:09	MA52505-CCB2	1		
08:14	MP33185-S1	200		rerun straight for FE
08:19	MP33185-S2	200		rerun straight for FE
08:24	JD45438-2F	200		rerun straight for FE
08:29	MP33185-SD1	1000		rerun straight for FE
08:34	JD45438-1F	200		rerun straight for FE
----->	Last reportable sample/prep for job JD45438			
08:40	MP33201-MB1	1		
08:45	MP33201-B1	1		
08:50	MA52505-CCV2	1		
08:55	MA52505-CCB3	1		
09:00	MP33201-S1	1		
09:05	MP33201-S2	1		
09:10	JD45638-2	1		(sample used for QC only; not part of login JD45438)
09:15	MP33201-SD1	5		
09:20	ZZZZZZ	1		
09:25	ZZZZZZ	1		
09:31	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52505  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:36	ZZZZZZ	1		
09:41	ZZZZZZ	1		
09:46	MA52505-CCV3	1		
09:51	MA52505-CCB4	1		
09:56	MA52505-CRID3	1		
10:02	ZZZZZZ	1		
10:07	ZZZZZZ	1		
10:12	ZZZZZZ	1		
10:17	ZZZZZZ	1		
10:22	ZZZZZZ	1		
10:28	ZZZZZZ	1		
10:40	MA52505-CRI2	1		
10:46	MA52505-ICSA2	1		
10:51	MA52505-ICSAB2	1		
10:56	MA52505-CCV4	1		
11:01	MA52505-CCB5	1		
----->	Last reportable CCB for job JD45438			
11:06	ZZZZZZ	1		
11:11	ZZZZZZ	1		
11:16	ZZZZZZ	1		
11:21	ZZZZZZ	1		
11:27	ZZZZZZ	1		
11:32	ZZZZZZ	1		
11:37	ZZZZZZ	1		
11:42	ZZZZZZ	1		
11:47	ZZZZZZ	1		
11:53	MA52505-CCV5	1		
11:58	MA52505-CCB6	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Element: Dilution	A F s e
06:48	MA52505-ICV1	1	X X
06:55	MA52505-ICB1	1	X X
07:01	MA52505-ICCV1	1	X X
07:12	MA52505-CCB1	1	X X
07:18	MA52505-CRI1	1	X X
07:23	MA52505-CRID1	1	
07:29	MA52505-ICSA1	1	X X
07:34	MA52505-ICSAB1	1	X X
07:38	MA52505-HSTD1	1	X X
07:44	MA52505-HSTD2	1	X X
07:49	MA52505-CRID2	1	X X
07:54	MP33185-B1	1	X X
07:59	MP33185-MB1	1	X X
08:04	MA52505-CCV1	1	X X
08:09	MA52505-CCB2	1	X X
08:14	MP33185-S1	200	X
08:19	MP33185-S2	200	X
08:24	JD45438-2F	200	X
08:29	MP33185-SD1	1000	X
08:34	JD45438-1F	200	X
08:40	MP33201-MB1	1	
08:45	MP33201-B1	1	
08:50	MA52505-CCV2	1	X X
08:55	MA52505-CCB3	1	X X
09:00	MP33201-S1	1	
09:05	MP33201-S2	1	
09:10	JD45638-2	1	(a)
09:15	MP33201-SD1	5	
09:20	ZZZZZZ	1	
09:25	ZZZZZZ	1	
09:31	ZZZZZZ	1	
09:36	ZZZZZZ	1	
09:41	ZZZZZZ	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Element: Dilution	A F s e
09:46	MA52505-CCV3	1	X X
09:51	MA52505-CCB4	1	X X
09:56	MA52505-CRID3	1	X X
10:02	ZZZZZZ	1	
10:07	ZZZZZZ	1	
10:12	ZZZZZZ	1	
10:17	ZZZZZZ	1	
10:22	ZZZZZZ	1	
10:28	ZZZZZZ	1	
10:40	MA52505-CRI2	1	X X
10:46	MA52505-ICSA2	1	X X
10:51	MA52505-ICSAB2	1	X X
10:56	MA52505-CCV4	1	X X
11:01	MA52505-CCB5	1	X X
11:06	ZZZZZZ	1	
11:11	ZZZZZZ	1	
11:16	ZZZZZZ	1	
11:21	ZZZZZZ	1	
11:27	ZZZZZZ	1	
11:32	ZZZZZZ	1	
11:37	ZZZZZZ	1	
11:42	ZZZZZZ	1	
11:47	ZZZZZZ	1	
11:53	MA52505-CCV5	1	X X
11:58	MA52505-CCB6	1	X X
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45438.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:37	MA52505-STD1	4072 R	132350 R	8429 R	9959 R
06:43	MA52505-STD2	3927	125460	8354	9449
06:48	MA52505-ICV1	3859	126830	8527	9277
06:55	MA52505-ICB1	4130	136660	8877	10070
07:01	MA52505-ICCV1	3969	130340	8888	9522
07:12	MA52505-CCB1	4056	132230	8624	9945
07:18	MA52505-CRI1	4113	137310	8773	10042
07:23	MA52505-CRID1	No results reported for the elements associated with this internal standard.			
07:29	MA52505-ICSA1	3781	125290	8715	9038
07:34	MA52505-ICSAB1	3752	115710	8224	8978
07:38	MA52505-HSTD1	3933	130220	8737	9743
07:44	MA52505-HSTD2	3714	124580	8656	8817
07:49	MA52505-CRID2	4029	134100	9058	9861
07:54	MP33185-B1	4000	133690	9137	9699
07:59	MP33185-MB1	4127	137210	9166	10128
08:04	MA52505-CCV1	4041	133620	9081	9754
08:09	MA52505-CCB2	4098	137430	9214	10075
08:14	MP33185-S1	4120	135770	9105	10128
08:19	MP33185-S2	4123	133510	9050	10130
08:24	JD45438-2F	4036	134550	9059	9890
08:29	MP33185-SD1	4116	137310	9142	10104
08:34	JD45438-1F	4195	134500	8904	10309
08:40	MP33201-MB1	4196	134340	9044	10307
08:45	MP33201-B1	4189	134650	9020	10170
08:50	MA52505-CCV2	4185	134120	8855	10107
08:55	MA52505-CCB3	4255	141720	9155	10444
09:00	MP33201-S1	4157	137600	9543	10063
09:05	MP33201-S2	4131	137850	9483	9991
09:10	JD45638-2	4202	140740	9612	10242
09:15	MP33201-SD1	4251	142750	9565	10444
09:20	ZZZZZZ	4169	141120	9685	10158
09:25	ZZZZZZ	4241	142620	9616	10345
09:31	ZZZZZZ	4235	141450	9562	10329

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52505

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
09:36	ZZZZZZ	4214	132000	8801	10224
09:41	ZZZZZZ	4246	136360	9317	10337
09:46	MA52505-CCV3	4130	134750	9157	9958
09:51	MA52505-CCB4	4329	139130	9473	10646
09:56	MA52505-CRID3	4301	135050	8879	10559
10:02	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:07	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:12	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:17	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:22	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:28	ZZZZZZ	10569 !	326150 !	17370 !	25025 !
10:40	MA52505-CRI2	4207	142050	9593	10134
10:46	MA52505-ICSA2	3844	126570	9018	9060
10:51	MA52505-ICSAB2	3885	130020	9344	9155
10:56	MA52505-CCV4	4196	141160	9512	9950
11:01	MA52505-CCB5	4261	145830	9689	10289
11:06	ZZZZZZ	4310	144370	9858	10568
11:11	ZZZZZZ	3638	123620	9031	8164
11:16	ZZZZZZ	3668	123380	9030	8205
11:21	ZZZZZZ	3752	124190	9040	8373
11:27	ZZZZZZ	3659	123770	8998	8205
11:32	ZZZZZZ	3654	123110	9171	8194
11:37	ZZZZZZ	3698	125220	9158	8268
11:42	ZZZZZZ	3665	124600	9136	8211
11:47	ZZZZZZ	3676	123350	9097	8240
11:53	MA52505-CCV5	4307	144440	9788	10154
11:58	MA52505-CCB6	4420	148650	9843	10601
12:03	ZZZZZZ	4459	148690	9809	10803
12:08	ZZZZZZ	4415	147360	9819	10587

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			06:55 ICB1		07:12 CCB1		08:09 CCB2		08:55 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	9.2	anr							
Antimony	6.0	2.8	anr							
Arsenic	3.0	2.6	0.700	<3.0	0.900	<3.0	1.70	<3.0	0.700	<3.0
Barium	200	.2	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.5								
Boron	100	1.8								
Cadmium	3.0	.4	anr							
Calcium	5000	13	anr							
Cerium	100									
Chromium	10	.7	anr							
Cobalt	50	.6	anr							
Copper	10	.7	anr							
Iron	100	3.3	4.20	<100	1.30	<100	0.400	<100	2.60	<100
Lead	3.0	2	anr							
Lithium	50	1.5								
Magnesium	5000	25	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6	anr							
Nickel	10	.8	anr							
Phosphorus	50	7								
Potassium	10000	35	anr							
Selenium	10	3.6	anr							
Silicon	200	2.2								
Silver	10	.6	anr							
Sodium	10000	14	anr							
Strontium	10	.1								
Sulfur	50	3.7								
Thallium	10	5.2	anr							
Tin	10	1.4								
Titanium	10	.8								
Tungsten	50	1.3								
Vanadium	50	.5	anr							



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			06:55 ICB1		07:12 CCB1		08:09 CCB2		08:55 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.3	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			09:51 CCB4		11:01 CCB5	
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	9.2	anr			
Antimony	6.0	2.8	anr			
Arsenic	3.0	2.6	1.60	<3.0	1.80	<3.0
Barium	200	.2	anr			
Beryllium	1.0	.2	anr			
Bismuth	20	2.5				
Boron	100	1.8				
Cadmium	3.0	.4	anr			
Calcium	5000	13	anr			
Cerium	100					
Chromium	10	.7	anr			
Cobalt	50	.6	anr			
Copper	10	.7	anr			
Iron	100	3.3	0.100	<100	-1.70	<100
Lead	3.0	2	anr			
Lithium	50	1.5				
Magnesium	5000	25	anr			
Manganese	15	.1	anr			
Molybdenum	20	.6	anr			
Nickel	10	.8	anr			
Phosphorus	50	7				
Potassium	10000	35	anr			
Selenium	10	3.6	anr			
Silicon	200	2.2				
Silver	10	.6	anr			
Sodium	10000	14	anr			
Strontium	10	.1				
Sulfur	50	3.7				
Thallium	10	5.2	anr			
Tin	10	1.4				
Titanium	10	.8				
Tungsten	50	1.3				
Vanadium	50	.5	anr			

BLANK RESULTS SUMMARY  
 Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			09:51 CCB4		11:01 CCB5	
Metal	RL	IDL	raw	final	raw	final

Zinc 20 .3 anr

Zirconium 10 .5

(\*) Outside of QC limits

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52505 Units: ug/l

Time:		07:01		
Sample ID:	ICCV	ICCV1		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	anr			
Arsenic	2000	1940	97.0	
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	40000	39300	98.3	
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52505      Units: ug/l

Time:		07:01
Sample ID:		ICCV
Metal		True
		Results % Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time: Sample ID:		06:48 ICV1		08:04 CCV1		08:50 CCV2			
Metal	ICV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2030	101.5	2000	1910	95.5	2000	1850	92.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	41100	102.8	40000	38500	96.3	40000	37900	94.8
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		06:48			08:04			08:50		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		09:46		10:56			
Sample ID:	CCV	CCV3		CCV	CCV4		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum	anr						
Antimony	anr						
Arsenic	2000	1800	90.0	2000	1820	91.0	
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	38000	95.0	40000	35100	87.8*(a)	
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum	anr						
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		09:46		10:56	
Sample ID:		CCV3		CCV4	
Metal	True	Results	% Rec	True	Results % Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

## HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 06/02/22  
Run ID: MA52505

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		07:38			07:44		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	8000	7380	92.3				
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron				200000	191000	95.5	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum	anr						
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52505 Units: ug/l

Time:		07:38		07:44	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.16

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:18 CRID1		07:49 CRID2		09:56 CRID3	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	9.60	120.0	3.10	103.3	3.20	106.7
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		106	106.0				
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20			anr					
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time:					07:18		07:49		09:56	
Sample ID:	CRI	CRIA	CRID		CRID1		CRID2		CRID3	
Metal	True	True	True		Results	% Rec	Results	% Rec	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.7

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	10:40 CRI2	% Rec
Metal	True	True	True	Results	
Aluminum	200	500	100	anr	116.3
Antimony	6.0	20	3.0	anr	
Arsenic	8.0	20	3.0	9.30	
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	anr	
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	99.8
Cobalt	50		3.0	anr	
Copper	10		2.0	anr	
Iron	100	500		99.8	
Lead	3.0	20	2.5	anr	
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20			anr	
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0	anr	
Silicon	200				
Silver	5.0		2.0	anr	
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0	anr	
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	anr	

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time:				10:40	
Sample ID:	CRI	CRIA	CRID	CRI2	
Metal	True	True	True	Results	% Rec

Zinc	20		10	anr	
Zirconium	10				

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52505      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:29 ICSAB1 Results	% Rec	07:34 ICSAB1 Results	% Rec	10:46 ICSAB2 Results	% Rec	10:51 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	491000	98.2	492000	98.4	452000	90.4	450000	90.0
Antimony		1000	-0.400		973	97.3	-1.50		917	91.7
Arsenic		1000	-2.40		949	94.9	0.00		900	90.0
Barium		500	3.30		474	94.8	3.30		439	87.8
Beryllium		500	1.00*(a)		473	94.6	0.600		443	88.6
Bismuth		500	-0.500		494	98.8	-2.20		465	93.0
Boron		500	1.10		486	97.2	0.500		450	90.0
Cadmium		1000	-1.00		997	99.7	-1.40		926	92.6
Calcium	400000	400000	382000	95.5	390000	97.5	349000	87.3	351000	87.8
Cerium			25.1		499*		26.3		476*	
Chromium		500	-1.40		474	94.8	-1.30		426	85.2
Cobalt		500	0.700		464	92.8	0.600		433	86.6
Copper		500	11.2*(a)		517	103.4	5.10		488	97.6
Iron	200000	200000	201000	100.5	198000	99.0	182000	91.0	177000	88.5
Lead		1000	1.90		915	91.5	-0.500		885	88.5
Lithium		500	1.90		466	93.2	3.80		438	87.6
Magnesium	500000	500000	486000	97.2	492000	98.4	451000	90.2	445000	89.0
Manganese		500	1.00		504	100.8	0.00		442	88.4
Molybdenum		500	1.20		459	91.8	0.600		437	87.4
Nickel		1000	0.600		900	90.0	1.30		862	86.2
Phosphorus		500	8.90		477	95.4	9.50		459	91.8
Potassium			17.0		42.3		2.00		-34.1	
Selenium		1000	-3.70		894	89.4	-8.20		837	83.7
Silicon		500	-18.0		497	99.4	-15.8		463	92.6
Silver		1000	1.70		1020	102.0	-4.00		948	94.8
Sodium			33.7		35.8		20.8		30.7	
Strontium		500	-0.900		477	95.4	-0.700		446	89.2
Sulfur		500	34.2		513	102.6	30.4		470	94.0
Thallium		1000	1.80		914	91.4	1.70		875	87.5
Tin		500	-4.20		461	92.2	-4.00		426	85.2
Titanium		500	-2.20		475	95.0	-1.90		444	88.8
Tungsten		500	-6.60		462	92.4	-4.60		430	86.0
Vanadium		500	-2.30		486	97.2	-1.40		444	88.8



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52505 Units: ug/l

Time:				07:29			07:34			10:46			10:51
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	10.1			920	92.0	9.10		882	88.2		
Zirconium		500	3.50			431	86.2	1.90		397	79.4*		

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:11	MA52515-STD1	1		STDA
12:16	MA52515-STD2	1		STDB
12:21	MA52515-ICV1	1		
12:29	MA52515-ICB1	1		
12:34	MA52515-CCV1	1		
12:38	MA52515-CCB1	1		
12:43	MA52515-CRID1	1		
12:48	MA52515-CRI1	1		
12:53	MA52515-ICSA1	1		
12:58	MA52515-ICSAB1	1		
13:03	MA52515-HSTD1	1		
13:09	MA52515-HSTD2	1		
13:16	MP33220-S1	5		
13:20	MP33220-S2	5		
13:25	ZZZZZZ	25		
13:33	MA52515-CCV2	1		
13:38	MA52515-CCB2	1		
13:43	MP33220-MB1	1		
13:48	JD45654-2F	5		(sample used for QC only; not part of login JD45438)
13:52	MP33220-SD1	25		
13:57	ZZZZZZ	50		
14:02	MP33220-B1	1		
14:07	ZZZZZZ	1		
14:12	ZZZZZZ	1		
14:18	ZZZZZZ	5		
14:23	ZZZZZZ	1		
14:28	MA52515-CCV3	1		
14:33	MA52515-CCB3	1		
14:38	MA52515-CRI2	1		
14:43	MA52515-CRID2	1		
14:48	MA52515-ICSA2	1		
14:53	MA52515-ICSAB2	1		
14:58	MP33185-S1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52515  
Parameters: Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:04	MP33185-S2	1		
15:09	JD45438-2F	1		
15:14	MP33185-SD1	5		
15:19	ZZZZZZ	1		
15:27	MA52515-CCV4	1		
15:31	MA52515-CCB4	1		
15:36	JD45438-1F	1		
----->	Last reportable sample/	1		prep for job JD45438
15:42	ZZZZZZ	1		
15:47	ZZZZZZ	1		
15:52	ZZZZZZ	1		
15:57	ZZZZZZ	1		
16:02	MA52515-CCV5	1		
16:10	MA52515-CCB5	1		
16:15	MA52515-CRI3	1		
16:20	MA52515-ICSA3	1		
16:25	MA52515-ICSAB3	1		
16:30	MA52515-CCV6	1		
16:35	MA52515-CCB6	1		
----->	Last reportable CCB for	1		job JD45438
16:40	ZZZZZZ	1		
16:45	ZZZZZZ	1		
16:50	ZZZZZZ	1		
Refer to raw data for calibration curve and standards.				

## REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Fe Dilution	e
12:21	MA52515-ICV1	1	X
12:29	MA52515-ICB1	1	X
12:34	MA52515-CCV1	1	X
12:38	MA52515-CCB1	1	X
12:43	MA52515-CRID1	1	X
12:48	MA52515-CRI1	1	X
12:53	MA52515-ICSA1	1	X
12:58	MA52515-ICSAB1	1	X
13:03	MA52515-HSTD1	1	X
13:09	MA52515-HSTD2	1	X
13:16	MP33220-S1	5	X
13:20	MP33220-S2	5	X
13:25	ZZZZZZ	25	
13:33	MA52515-CCV2	1	X
13:38	MA52515-CCB2	1	X
13:43	MP33220-MB1	1	X
13:48	JD45654-2F	5	X (a)
13:52	MP33220-SD1	25	X
13:57	ZZZZZZ	50	
14:02	MP33220-B1	1	X
14:07	ZZZZZZ	1	
14:12	ZZZZZZ	1	
14:18	ZZZZZZ	5	
14:23	ZZZZZZ	1	
14:28	MA52515-CCV3	1	X
14:33	MA52515-CCB3	1	X
14:38	MA52515-CRI2	1	X
14:43	MA52515-CRID2	1	X
14:48	MA52515-ICSA2	1	X
14:53	MA52515-ICSAB2	1	X
14:58	MP33185-S1	1	X
15:04	MP33185-S2	1	X
15:09	JD45438-2F	1	X
		Element: Fe	e

# REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Fe Dilution	e
15:14	MP33185-SD1	5	X
15:19	ZZZZZZ	1	
15:27	MA52515-CCV4	1	X
15:31	MA52515-CCB4	1	X
15:36	JD45438-1F	1	X
15:42	ZZZZZZ	1	
15:47	ZZZZZZ	1	
15:52	ZZZZZZ	1	
15:57	ZZZZZZ	1	
16:02	MA52515-CCV5	1	X
16:10	MA52515-CCB5	1	X
16:15	MA52515-CRI3	1	X
16:20	MA52515-ICSA3	1	X
16:25	MA52515-ICSAB3	1	X
16:30	MA52515-CCV6	1	X
16:35	MA52515-CCB6	1	X
16:40	ZZZZZZ	1	
16:45	ZZZZZZ	1	
16:50	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45438.

Element: Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:11	MA52515-STD1	5447 R	170800 R	17890 R	10639 R
12:16	MA52515-STD2	5199	161480	17783	9473
12:21	MA52515-ICV1	5276	163330	17707	9759
12:29	MA52515-ICB1	5385	170350	17903	10582
12:34	MA52515-CCV1	5337	165140	17913	9821
12:38	MA52515-CCB1	5429	170500	17947	10639
12:43	MA52515-CRID1	5422	171200	17932	10620
12:48	MA52515-CRI1	5362	168100	17734	10464
12:53	MA52515-ICSA1	4988	153240	17706	8890
12:58	MA52515-ICSAB1	4995	153440	17901	8896
13:03	MA52515-HSTD1	5410	170820	18103	10503
13:09	MA52515-HSTD2	5027	155540	17655	8915
13:16	MP33220-S1	5349	166980	17855	10138
13:20	MP33220-S2	5397	168410	18091	10205
13:25	ZZZZZZ	5437	169920	18235	10417
13:33	MA52515-CCV2	5353	166280	17762	9887
13:38	MA52515-CCB2	5455	170830	17843	10739
13:43	MP33220-MB1	5522	175690	18492	10838
13:48	JD45654-2F	5468	171220	18311	10420
13:52	MP33220-SD1	5518	172940	18198	10716
13:57	ZZZZZZ	5519	171650	18154	10782
14:02	MP33220-B1	5450	170220	18352	10221
14:07	ZZZZZZ	5010	155560	18004	9023
14:12	ZZZZZZ	5571	176380	18618	10952
14:18	ZZZZZZ	5362	167910	18242	9978
14:23	ZZZZZZ	5440	170230	18248	10820
14:28	MA52515-CCV3	5423	168050	18137	10011
14:33	MA52515-CCB3	5445	172030	17895	10746
14:38	MA52515-CRI2	5488	172200	18115	10680
14:43	MA52515-CRID2	5542	173630	18266	10847
14:48	MA52515-ICSA2	5125	155980	18158	9136
14:53	MA52515-ICSAB2	5145	156900	18112	9145
14:58	MP33185-S1	4923	155420	17956	8866

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:04	MP33185-S2	4871	154140	17715	8806
15:09	JD45438-2F	4933	154930	17970	8904
15:14	MP33185-SD1	5421	170310	18540	10072
15:19	ZZZZZZ	5482	172050	18819	10197
15:27	MA52515-CCV4	5590	173350	18743	10284
15:31	MA52515-CCB4	5574	176300	18412	10972
15:36	JD45438-1F	4867	153810	17828	8787
15:42	ZZZZZZ	5558	174960	18811	10546
15:47	ZZZZZZ	5678	178540	19210	10742
15:52	ZZZZZZ	5741	179150	18997	10813
15:57	ZZZZZZ	5739	180070	19030	11270
16:02	MA52515-CCV5	5513	173210	18730	10189
16:10	MA52515-CCB5	5671	177910	18245	11127
16:15	MA52515-CRI3	5661	177000	18545	10968
16:20	MA52515-ICSA3	5252	160780	18517	9326
16:25	MA52515-ICSAB3	5135	157850	17996	9173
16:30	MA52515-CCV6	5581	171700	18361	10279
16:35	MA52515-CCB6	5710	178760	18652	11180
16:40	ZZZZZZ	5541	175480	18314	11104
16:45	ZZZZZZ	5616	176710	18247	11051
16:50	ZZZZZZ	5744	180800	18769	11282

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:				12:29 ICB1			12:38 CCB1			13:38 CCB2			14:33 CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final	raw	final	raw	final	
Aluminum	200	17													
Antimony	6.0	1.7	anr												
Arsenic	3.0	2.1	anr												
Barium	200	.8	anr												
Beryllium	1.0	.3	anr												
Bismuth	20	2.3													
Boron	100	2.3													
Cadmium	3.0	.3	anr												
Calcium	5000	6.6													
Cerium	100														
Chromium	10	.3													
Cobalt	50	.4													
Copper	10	.8	anr												
Iron	100	5.3	-2.00	<100	-3.30	<100	-0.200	<100	0.400	<100					
Lead	3.0	1.1	anr												
Lithium	50	4.8													
Magnesium	5000	32													
Manganese	15	.1	anr												
Molybdenum	20	.6													
Nickel	10	.4	anr												
Phosphorus	50	1.2													
Potassium	10000	77	anr												
Selenium	10	3.2	anr												
Silicon	200	1.7													
Silver	10	1	anr												
Sodium	10000	34	anr												
Strontium	10	.3													
Sulfur	50	3													
Thallium	10	1.8	anr												
Tin	10	.8	anr												
Titanium	10	.5													
Tungsten	50	2.6													
Vanadium	50	.6													



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			15:31 CCB4		16:10 CCB5		16:35 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	17						
Antimony	6.0	1.7	anr					
Arsenic	3.0	2.1	anr					
Barium	200	.8	anr					
Beryllium	1.0	.3	anr					
Bismuth	20	2.3						
Boron	100	2.3						
Cadmium	3.0	.3	anr					
Calcium	5000	6.6						
Cerium	100							
Chromium	10	.3						
Cobalt	50	.4						
Copper	10	.8	anr					
Iron	100	5.3	1.10	<100	-0.900	<100	0.300	<100
Lead	3.0	1.1	anr					
Lithium	50	4.8						
Magnesium	5000	32						
Manganese	15	.1	anr					
Molybdenum	20	.6						
Nickel	10	.4	anr					
Phosphorus	50	1.2						
Potassium	10000	77	anr					
Selenium	10	3.2	anr					
Silicon	200	1.7						
Silver	10	1	anr					
Sodium	10000	34	anr					
Strontium	10	.3						
Sulfur	50	3						
Thallium	10	1.8	anr					
Tin	10	.8	anr					
Titanium	10	.5						
Tungsten	50	2.6						
Vanadium	50	.6						

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52515      Units: ug/l

Time: Sample ID:			15:31 CCB4		16:10 CCB5		16:35 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc                    20                    .1                    anr

Zirconium            10                    .3

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.3  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Aluminum										
Antimony	anr									
Arsenic	anr									
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	anr									
Calcium										
Cerium										
Chromium										
Cobalt										
Copper	anr									
Iron	40000	40700	101.8	40000	39300	98.3	40000	38700	96.8	
Lead	anr									
Lithium										
Magnesium										
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur										
Thallium	anr									
Tin	anr									
Titanium										
Tungsten										
Vanadium										

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:		14:28 CCV3		15:27 CCV4		16:02 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium									
Cerium									
Chromium									
Cobalt									
Copper	anr								
Iron	40000	37700	94.3	40000	36600	91.5	40000	36800	92.0
Lead	anr								
Lithium									
Magnesium									
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin	anr								
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28			15:27			16:02		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID: CCV		16:30 CCV6		
Metal	True	Results	% Rec	
Aluminum				
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	40000	36500	91.3	
Lead	anr			
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin	anr			
Titanium				
Tungsten				
Vanadium				

6.2.4  
6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		16:30
Sample ID:		CCV
Metal		True
		Results
		% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03			13:09		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron				200000	186000	93.0	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur							
Thallium	anr						
Tin	anr						
Titanium							
Tungsten							
Vanadium							

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03			13:09		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.2.5

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	12:43 CRID1		12:48 CRI1		14:38 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	anr					
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				99.3	99.3	95.5	95.5
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					12:43		12:48		14:38	
Sample ID:	CRI	CRIA	CRID	CRID1	CRID1		CRI1		CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:43 CRID2	% Rec	16:15 CRI3	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100				
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	anr			
Barium	200		4.0	anr			
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0	anr			
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0				
Copper	10		2.0				
Iron	100	500				91.8	91.8
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0	anr			
Molybdenum	20						
Nickel	10		4.0	anr			
Phosphorus	50						
Potassium	5000		2000	anr			
Selenium	10	20	5.0				
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000	anr			
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					14:43		16:15	
Sample ID:	CRI	CRIA	CRID	CRID2	CRI3			
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	12:53 ICSAB1 Results	% Rec	12:58 ICSAB1 Results	% Rec	14:48 ICSAB2 Results	% Rec	14:53 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	478000	95.6	471000	94.2	455000	91.0	458000	91.6
Antimony		1000	1.90		927	92.7	4.20		899	89.9
Arsenic		1000	-1.30		940	94.0	-1.00		904	90.4
Barium		500	5.90		465	93.0	5.40		447	89.4
Beryllium		500	0.200		461	92.2	0.200		449	89.8
Bismuth		500	-16.3		470	94.0	-16.8		449	89.8
Boron		500	0.500		465	93.0	-0.200		448	89.6
Cadmium		1000	-0.800		981	98.1	-1.20		944	94.4
Calcium	400000	400000	377000	94.3	376000	94.0	357000	89.3	364000	91.0
Cerium			144*		605*		141*		584*	
Chromium		500	5.40		465	93.0	4.60		451	90.2
Cobalt		500	1.10		469	93.8	1.30		453	90.6
Copper		500	1.20		482	96.4	1.10		470	94.0
Iron	200000	200000	197000	98.5	192000	96.0	189000	94.5	185000	92.5
Lead		1000	1.70		901	90.1	-1.90		873	87.3
Lithium		500	-5.50		455	91.0	-8.10		437	87.4
Magnesium	500000	500000	479000	95.8	477000	95.4	464000	92.8	462000	92.4
Manganese		500	-1.90		483	96.6	-2.30		468	93.6
Molybdenum		500	-2.80		454	90.8	-2.30		437	87.4
Nickel		1000	-3.70		896	89.6	-3.90		866	86.6
Phosphorus		500	-2.40		451	90.2	-2.00		433	86.6
Potassium			-601		-590		-606		-567	
Selenium		1000	-4.50		875	87.5	0.800		846	84.6
Silicon		500	3.40		505	101.0	4.10		489	97.8
Silver		1000	1.50		947	94.7	0.200		921	92.1
Sodium			110		127		149		126	
Strontium		500	-0.900		464	92.8	-0.800		448	89.6
Sulfur		500	24.0		484	96.8	20.5		474	94.8
Thallium		1000	-3.70		882	88.2	-2.90		852	85.2
Tin		500	-5.70		450	90.0	-5.50		436	87.2
Titanium		500	-1.80		471	94.2	-1.60		457	91.4
Tungsten		500	-2.30		462	92.4	-2.50		443	88.6
Vanadium		500	1.70		474	94.8	2.50		460	92.0



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				12:53			12:58			14:48			14:53
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	-3.40			906	90.6	-3.10		874	87.4		
Zirconium		500	-7.00			428	85.6	-7.00		415	83.0		

(\*) Outside of QC limits  
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA	ICSAB	16:20 ICSA3		16:25 ICSAB3	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	500000	500000	450000	90.0	448000	89.6
Antimony		1000	1.80		872	87.2
Arsenic		1000	1.20		881	88.1
Barium		500	5.20		440	88.0
Beryllium		500	0.100		432	86.4
Bismuth		500	-15.3		441	88.2
Boron		500	0.500		439	87.8
Cadmium		1000	-0.800		928	92.8
Calcium	400000	400000	354000	88.5	357000	89.3
Cerium			137*		573*	
Chromium		500	4.80		440	88.0
Cobalt		500	0.800		442	88.4
Copper		500	0.700		458	91.6
Iron	200000	200000	185000	92.5	182000	91.0
Lead		1000	-0.100		847	84.7
Lithium		500	-7.90		435	87.0
Magnesium	500000	500000	449000	89.8	449000	89.8
Manganese		500	-2.10		455	91.0
Molybdenum		500	-2.10		427	85.4
Nickel		1000	-3.60		839	83.9
Phosphorus		500	-1.80		424	84.8
Potassium			-549		-528	
Selenium		1000	0.500		821	82.1
Silicon		500	1.90		476	95.2
Silver		1000	1.00		900	90.0
Sodium			154		139	
Strontium		500	-0.900		440	88.0
Sulfur		500	37.9		465	93.0
Thallium		1000	1.10		826	82.6
Tin		500	-5.40		425	85.0
Titanium		500	-1.60		444	88.8
Tungsten		500	-3.20		431	86.2
Vanadium		500	2.00		448	89.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				16:20		16:25	
Sample ID:		ICSA	ICSAB	ICSA3		ICSAB3	
Metal		True	True	Results	% Rec	Results	% Rec

Zinc		1000		-2.90		854	85.4
Zirconium		500		-6.60		401	80.2

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	9.2	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	0.70	<3.0
Barium	200	.2	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	1.8	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	3.3	32	7.9	<100
Lead	3.0	1.1	1.8		
Lithium	50	1.5	7.3		
Magnesium	5000	25	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	35	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	14	570		
Strontium	10	.1	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	1.3	40		
Vanadium	50	.5	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .1 6.9

Zirconium 10 .3 4.1

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	633000	631000	2000	-100.0(a) 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	108000	129000	25000	84.0 75-125
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	633000	634000	2000	50.0 (a)	0.5	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	108000	130000	25000	88.0	0.8	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45438

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/01/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1870	2000	93.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	25300	25000	101.2	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

## 6.3.3 6

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Zinc                      anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	389000	651000	2.9	0-10
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	108000	112000	3.3	0-10
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04 PO#4862.04

SGS Job Number: JD45490

Sampling Date: 05/25/22



Report to:

Sanborn Head & Associates, Inc.  
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ATTN: Chelsey Shepsko

Total number of pages in report: **16**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Sample Summary

Sunoco/Evergreen

Job No: JD45490

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JD45490-1	05/25/22	11:20 MF	05/25/22	AQ	Ground Water	MW-606D_20220525
JD45490-2	05/25/22	12:20 MF	05/25/22	AQ	Ground Water	MW-56D_20220525
JD45490-3	05/25/22	13:45 MF	05/25/22	AQ	Ground Water	MW-531L_20220525
JD45490-4	05/25/22	15:00 MF	05/25/22	AQ	Ground Water	MW-532L_20220525



## Summary of Hits

Page 1 of 1

**Job Number:** JD45490  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/25/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD45490-1</b>	<b>MW-606D_20220525</b>					
Sulfate		8860	60		mg/l	EPA 300/SW846 9056A
Sulfide		6.0	2.0		mg/l	SM4500S2- F-11
<b>JD45490-2</b>	<b>MW-56D_20220525</b>					
Sulfide		5.4	2.0		mg/l	SM4500S2- F-11
<b>JD45490-3</b>	<b>MW-531L_20220525</b>					
Sulfide		3.6	2.0		mg/l	SM4500S2- F-11
<b>JD45490-4</b>	<b>MW-532L_20220525</b>					
Sulfate		1700	14		mg/l	EPA 300/SW846 9056A
Sulfide		7.1	2.0		mg/l	SM4500S2- F-11

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-606D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45490-1	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	8860	60	mg/l	30	06/03/22 21:26	JD	EPA 300/SW846 9056A
Sulfide	6.0	2.0	mg/l	1	05/28/22 10:33	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45490-2	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	< 2.0	2.0	mg/l	1	06/02/22 15:41	JD	EPA 300/SW846 9056A
Sulfide	5.4	2.0	mg/l	1	05/28/22 10:33	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-531L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45490-3	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	< 2.0	2.0	mg/l	1	06/02/22 15:54	JD	EPA 300/SW846 9056A
Sulfide	3.6	2.0	mg/l	1	05/28/22 10:33	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-532L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45490-4	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1700	14	mg/l	7	06/03/22 21:39	JD	EPA 300/SW846 9056A
Sulfide	7.1	2.0	mg/l	1	05/28/22 10:33	MP	SM4500S2- F-11

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

[illegible]

## JD45490: Chain of Custody

Page 1 of 2



## SGS Sample Receipt Summary

Job Number: JD45490

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/25/2022 5:00:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (2.3);

Cooler Temps (Corrected) °C: Cooler 1: (2.0);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD45490: Chain of Custody

Page 2 of 2

## General Chemistry

5

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45490  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Sulfate	GP40425/GN29829	2.0	0.0	mg/l	80	75.9	94.9	90-110%
Sulfide	GN29711	2.0	0.0	mg/l	5	5.0	100.0	80-120%
Sulfide	GN29711			mg/l	10	9.9	99.0	80-120%

Associated Samples:  
Batch GN29711: JD45490-1, JD45490-2, JD45490-3, JD45490-4  
Batch GP40425: JD45490-1, JD45490-2, JD45490-3, JD45490-4  
(\*) Outside of QC limits

5.1  
5

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45490  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Sulfate	GP40425/GN29829	JD45473-1	mg/l	148	147	0.7	0-20%
Sulfide	GN29711	JD45556-6	mg/l	-1.9	0.0	0.0	0-12%

Associated Samples:  
Batch GN29711: JD45490-1, JD45490-2, JD45490-3, JD45490-4  
Batch GP40425: JD45490-1, JD45490-2, JD45490-3, JD45490-4  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45490  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Sulfate	GP40425/GN29829	JD45473-1	mg/l	148	80	225	96.3	80-120%
Sulfide	GN29711	JD45556-6	mg/l	-1.9	3.57	3.1	86.8	37-135%

Associated Samples:

Batch GN29711: JD45490-1, JD45490-2, JD45490-3, JD45490-4

Batch GP40425: JD45490-1, JD45490-2, JD45490-3, JD45490-4

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04 PO#4862.04

SGS Job Number: JD45493

Sampling Date: 05/25/22



Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 52



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD45493

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45493-1F	05/25/22	11:20 MF	05/25/22	AQ	Groundwater Filtered	MW-606D_20220525
JD45493-2F	05/25/22	12:20 MF	05/25/22	AQ	Groundwater Filtered	MW-56D_20220525
JD45493-3F	05/25/22	13:45 MF	05/25/22	AQ	Groundwater Filtered	MW-531L_20220525
JD45493-4F	05/25/22	15:00 MF	05/25/22	AQ	Groundwater Filtered	MW-532L_20220525
JD45493-4FD	05/25/22	15:00 MF	05/25/22	AQ	Water Dup/MSD	MW-532L_20220525
JD45493-4FS	05/25/22	15:00 MF	05/25/22	AQ	Water Matrix Spike	MW-532L_20220525
JD45493-5F	05/25/22	15:00 MF	05/25/22	AQ	Groundwater Filtered	MW-532L_20220525_DUP



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45493

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/2/2022 11:24:24 AM

On 05/25/2022, 5 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45493 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33174

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45493-4FMS, JD45493-4FMSD, JD45493-4FSDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- MP33174-MB1 for Arsenic: All reported results >3000x MB value.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

## Summary of Hits

Page 1 of 1

**Job Number:** JD45493  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/25/22



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD45493-1F      MW-606D_20220525</b>						
Arsenic		636000	600		ug/l	SW846 6010D
Iron		319000	20000		ug/l	SW846 6010D
<b>JD45493-2F      MW-56D_20220525</b>						
Arsenic		386000	600		ug/l	SW846 6010D
Iron		115000	100		ug/l	SW846 6010D
<b>JD45493-3F      MW-531L_20220525</b>						
Arsenic		202000	300		ug/l	SW846 6010D
Iron		45600	100		ug/l	SW846 6010D
<b>JD45493-4F      MW-532L_20220525</b>						
Arsenic		1430000	600		ug/l	SW846 6010D
Iron		60300	100		ug/l	SW846 6010D
<b>JD45493-5F      MW-532L_20220525_DUP</b>						
Arsenic		1380000	600		ug/l	SW846 6010D
Iron		51700	100		ug/l	SW846 6010D

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-606D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-1F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	636000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	319000	20000	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496

(2) Prep QC Batch: MP33174

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-2F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	386000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	115000	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-531L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-3F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	202000	300	ug/l	100	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	45600	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-532L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-4F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	1430000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	60300	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496

(2) Prep QC Batch: MP33174

RL = Reporting Limit

4.4  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-532L_20220525_DUP	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-5F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	1380000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	51700	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174

RL = Reporting Limit

4.5  
4



## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



## SGS Sample Receipt Summary

**Job Number:** JD45493

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 5/25/2022 7:00:00 PM

**Delivery Method:**

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.3);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.0);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

**JD45493: Chain of Custody**

**Page 2 of 2**

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD45493

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD45493-1F Collected: 25-MAY-22 11:20 By: MF Received: 25-MAY-22 By: DG MW-606D_20220525						
JD45493-1F SW846 6010D		01-JUN-22 10:50	ND	31-MAY-22 SF		AS,FE
JD45493-2F Collected: 25-MAY-22 12:20 By: MF Received: 25-MAY-22 By: DG MW-56D_20220525						
JD45493-2F SW846 6010D		01-JUN-22 09:17	ND	31-MAY-22 SF		FE
JD45493-2F SW846 6010D		01-JUN-22 10:55	ND	31-MAY-22 SF		AS
JD45493-3F Collected: 25-MAY-22 13:45 By: MF Received: 25-MAY-22 By: DG MW-531L_20220525						
JD45493-3F SW846 6010D		01-JUN-22 09:22	ND	31-MAY-22 SF		FE
JD45493-3F SW846 6010D		01-JUN-22 11:00	ND	31-MAY-22 SF		AS
JD45493-4F Collected: 25-MAY-22 15:00 By: MF Received: 25-MAY-22 By: DG MW-532L_20220525						
JD45493-4F SW846 6010D		01-JUN-22 09:02	ND	31-MAY-22 SF		FE
JD45493-4F SW846 6010D		01-JUN-22 10:40	ND	31-MAY-22 SF		AS
JD45493-5F Collected: 25-MAY-22 15:00 By: MF Received: 25-MAY-22 By: DG MW-532L_20220525_DUP						
JD45493-5F SW846 6010D		01-JUN-22 09:27	ND	31-MAY-22 SF		FE
JD45493-5F SW846 6010D		01-JUN-22 11:05	ND	31-MAY-22 SF		AS

# SGS Internal Chain of Custody

Page 1 of 2

**Job Number:** JD45493  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/25/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45493-1F.1	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-1F.1	Secured Storage	Benjamin Gaines	05/29/22 09:43	Retrieve from Storage
JD45493-1F.1	Benjamin Gaines	Secured Staging Area	05/29/22 09:43	Return to Storage
JD45493-1F.1	Secured Staging Area	Alyssa Koshy	05/31/22 08:22	Retrieve from Storage
JD45493-1F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45493-1F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 11:31	Digestate from JD45493-1F.1
JD45493-1F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 11:31	Digestate from JD45493-1F.1
JD45493-1F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 11:31	Return to Storage
JD45493-2F.1	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-2F.1	Secured Storage	Benjamin Gaines	05/29/22 09:43	Retrieve from Storage
JD45493-2F.1	Benjamin Gaines	Secured Staging Area	05/29/22 09:43	Return to Storage
JD45493-2F.1	Secured Staging Area	Alyssa Koshy	05/31/22 08:22	Retrieve from Storage
JD45493-2F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45493-2F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 11:31	Digestate from JD45493-2F.1
JD45493-2F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 11:31	Digestate from JD45493-2F.1
JD45493-2F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 11:31	Return to Storage
JD45493-3F.1	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-3F.1	Secured Storage	Benjamin Gaines	05/29/22 09:43	Retrieve from Storage
JD45493-3F.1	Benjamin Gaines	Secured Staging Area	05/29/22 09:43	Return to Storage
JD45493-3F.1	Secured Staging Area	Alyssa Koshy	05/31/22 08:22	Retrieve from Storage
JD45493-3F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45493-3F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 11:31	Digestate from JD45493-3F.1
JD45493-3F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 11:31	Digestate from JD45493-3F.1
JD45493-3F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 11:31	Return to Storage
JD45493-4F.1	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-4F.1	Secured Storage	Benjamin Gaines	05/29/22 09:43	Retrieve from Storage
JD45493-4F.1	Benjamin Gaines	Secured Staging Area	05/29/22 09:43	Return to Storage
JD45493-4F.1	Secured Staging Area	Alyssa Koshy	05/31/22 08:22	Retrieve from Storage
JD45493-4F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45493-4F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 11:31	Digestate from JD45493-4F.1
JD45493-4F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 11:31	Digestate from JD45493-4F.1
JD45493-4F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 11:31	Return to Storage
JD45493-4F.2	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-4F.3	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage

## SGS Internal Chain of Custody

Page 2 of 2

**Job Number:** JD45493  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/25/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45493-5F.1	James Kwon	Secured Storage	05/26/22 15:09	Return to Storage
JD45493-5F.1	Secured Storage	Benjamin Gaines	05/29/22 09:43	Retrieve from Storage
JD45493-5F.1	Benjamin Gaines	Secured Staging Area	05/29/22 09:43	Return to Storage
JD45493-5F.1	Secured Staging Area	Alyssa Koshy	05/31/22 08:22	Retrieve from Storage
JD45493-5F.1	Alyssa Koshy	Secured Storage	05/31/22 12:52	Return to Storage
JD45493-5F.1.1	Alyssa Koshy	Metals Digestion	05/31/22 11:31	Digestate from JD45493-5F.1
JD45493-5F.1.1	Metals Digestion	Alyssa Koshy	05/31/22 11:31	Digestate from JD45493-5F.1
JD45493-5F.1.1	Alyssa Koshy	Metals Digestate Storage	05/31/22 11:31	Return to Storage

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52496  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:09	MA52496-STD1	1		STDA
07:14	MA52496-STD2	1		STDB
07:19	MA52496-ICV1	1		
07:26	MA52496-ICB1	1		
07:32	MA52496-CCV1	1		
07:36	MA52496-CCB1	1		
07:41	MA52496-CRID1	1		
07:46	MA52496-CRI1	1		
07:51	MA52496-ICSA1	1		
07:56	MA52496-ICSAB1	1		
08:01	MA52496-HSTD1	1		
08:07	MA52496-HSTD2	1		
08:12	ZZZZZZ	1		
08:17	ZZZZZZ	1		
08:22	MA52496-CRI2	1		
08:27	ZZZZZZ	1		
08:32	MA52496-CCV2	1		
08:37	MA52496-CCB2	1		
08:42	MP33174-MB1	1		
08:46	MP33174-B1	1		
08:51	MP33174-S1	1		
08:56	MP33174-S2	1		
09:02	JD45493-4F	1		
09:07	MP33174-SD1	5		
09:12	JD45493-1F	1		
09:17	JD45493-2F	1		
09:22	JD45493-3F	1		
09:27	JD45493-5F	1		
09:35	MA52496-CCV3	1		
09:40	MA52496-CCB3	1		
10:15	MA52496-CCV4	1		
10:20	MA52496-CCB4	1		
10:31	MP33174-S1	200		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52496  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:36	MP33174-S2	200		
10:40	JD45493-4F	200		
10:45	MP33174-SD1	1000		
10:50	JD45493-1F	200		
10:55	JD45493-2F	200		
11:00	JD45493-3F	100		
11:05	JD45493-5F	200		
----->	Last reportable sample/prep for job JD45493			
11:13	ZZZZZ	1		
11:29	MA52496-CCV5	1		
11:38	MA52496-CCB5	1		
11:43	MA52496-CRID2	1		
11:48	MA52496-CRI3	1		
11:53	MA52496-ICSA2	1		
11:58	MA52496-ICSAB2	1		
12:03	MA52496-CCV6	1		
12:08	MA52496-CCB6	1		
----->	Last reportable CCB for job JD45493			
	Refer to raw data for calibration curve and standards.			

REPORTED ELEMENTS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Element: Dilution	A F s e
07:19	MA52496-ICV1	1	X X
07:26	MA52496-ICB1	1	X X
07:32	MA52496-CCV1	1	X X
07:36	MA52496-CCB1	1	X X
07:41	MA52496-CRID1	1	X X
07:46	MA52496-CRI1	1	X X
07:51	MA52496-ICSA1	1	X X
07:56	MA52496-ICSAB1	1	X X
08:01	MA52496-HSTD1	1	X X
08:07	MA52496-HSTD2	1	X X
08:12	ZZZZZZ	1	
08:17	ZZZZZZ	1	
08:22	MA52496-CRI2	1	X X
08:27	ZZZZZZ	1	
08:32	MA52496-CCV2	1	X X
08:37	MA52496-CCB2	1	X X
08:42	MP33174-MB1	1	X X
08:46	MP33174-B1	1	X X
08:51	MP33174-S1	1	X
08:56	MP33174-S2	1	X
09:02	JD45493-4F	1	X
09:07	MP33174-SD1	5	X
09:12	JD45493-1F	1	
09:17	JD45493-2F	1	X
09:22	JD45493-3F	1	X
09:27	JD45493-5F	1	X
09:35	MA52496-CCV3	1	X X
09:40	MA52496-CCB3	1	X X
10:15	MA52496-CCV4	1	X X
10:20	MA52496-CCB4	1	X X
10:31	MP33174-S1	200	X
10:36	MP33174-S2	200	X
10:40	JD45493-4F	200	X
		Element: A F s e	

# REPORTED ELEMENTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52496  
 Parameters: As,Fe

Time	Sample Description	Element: Dilution	A F s e
10:45	MP33174-SD1	1000	X
10:50	JD45493-1F	200	X X
10:55	JD45493-2F	200	X
11:00	JD45493-3F	100	X
11:05	JD45493-5F	200	X
11:13	ZZZZZZ	1	
11:29	MA52496-CCV5	1	X X
11:38	MA52496-CCB5	1	X X
11:43	MA52496-CRID2	1	X X
11:48	MA52496-CRI3	1	X X
11:53	MA52496-ICSA2	1	X X
11:58	MA52496-ICSAB2	1	X X
12:03	MA52496-CCV6	1	X X
12:08	MA52496-CCB6	1	X X
		Element: A F s e	

## INTERNAL STANDARD SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:09	MA52496-STD1	5922 R	174400 R	17897 R	10465 R
07:14	MA52496-STD2	5655	163710	17799	9333
07:19	MA52496-ICV1	5791	168480	17902	9621
07:26	MA52496-ICB1	5960	175940	18045	10503
07:32	MA52496-CCV1	5848	169670	18044	9683
07:36	MA52496-CCB1	5997	177330	18170	10524
07:41	MA52496-CRID1	5998	177280	18210	10495
07:46	MA52496-CRI1	5982	176500	18290	10364
07:51	MA52496-ICSA1	5497	157530	17964	8802
07:56	MA52496-ICSAB1	5522	158330	17933	8827
08:01	MA52496-HSTD1	5917	174150	18252	10389
08:07	MA52496-HSTD2	5557	160220	17982	8837
08:12	ZZZZZZ	6082	177980	18504	10789
08:17	ZZZZZZ	6044	181240	18581	10858
08:22	MA52496-CRI2	6050	178230	18384	10497
08:27	ZZZZZZ	6104	180040	18404	10682
08:32	MA52496-CCV2	5959	173470	18422	9864
08:37	MA52496-CCB2	6138	181130	18449	10752
08:42	MP33174-MB1	6164	182850	18855	10800
08:46	MP33174-B1	6121	178630	18821	10255
08:51	MP33174-S1	5452	160040	18172	8664
08:56	MP33174-S2	5511	161530	18308	8719
09:02	JD45493-4F	5565	163730	18728	8806
09:07	MP33174-SD1	6020	177350	19240	9911
09:12	JD45493-1F	5206	150970	18549	8240
09:17	JD45493-2F	5525	160750	18400	8806
09:22	JD45493-3F	5873	173490	19014	9536
09:27	JD45493-5F	5568	164580	18621	8820
09:35	MA52496-CCV3	6096	177240	18813	10116
09:40	MA52496-CCB3	6242	186440	19020	10980
10:15	MA52496-CCV4	6141	179240	19115	10169
10:20	MA52496-CCB4	6337	186650	19259	11098
10:31	MP33174-S1	6362	188300	19237	11073

## INTERNAL STANDARD SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:36	MP33174-S2	6350	187820	19438	11078
10:40	JD45493-4F	6337	187150	19327	11065
10:45	MP33174-SD1	6354	188110	19384	11134
10:50	JD45493-1F	6322	187050	19447	10947
10:55	JD45493-2F	6343	188690	19496	11058
11:00	JD45493-3F	6357	188840	19404	11125
11:05	JD45493-5F	6377	189220	19506	11115
11:13	ZZZZZZ	6485	193490	19734	11360
11:29	MA52496-CCV5	6276	183040	19588	10382
11:38	MA52496-CCB5	6446	191430	19679	11305
11:43	MA52496-CRID2	6414	190750	19701	11207
11:48	MA52496-CRI3	6423	190310	19714	11127
11:53	MA52496-ICSA2	5896	170180	19322	9421
11:58	MA52496-ICSAB2	5935	171400	19414	9471
12:03	MA52496-CCV6	6335	185120	19677	10455
12:08	MA52496-CCB6	6512	191530	19957	11366

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:			07:26 ICB1		07:36 CCB1		08:37 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7								
Arsenic	3.0	2.1	-0.500	<3.0	0.00	<3.0	0.900	<3.0	10.6	* (a)
Barium	200	.8								
Beryllium	1.0	.3								
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3								
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3								
Cobalt	50	.4								
Copper	10	.8								
Iron	100	5.3	3.00	<100	4.10	<100	1.70	<100	4.10	<100
Lead	3.0	1.1								
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1								
Molybdenum	20	.6								
Nickel	10	.4								
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2								
Silicon	200	1.7								
Silver	10	1								
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8								
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:			07:26 ICB1		07:36 CCB1		08:37 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1								
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										
(a) No samples reported for this element in the area bracketed by this QC.										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:				10:20 CCB4			11:38 CCB5			12:08 CCB6		
Metal	RL	IDL		raw	final		raw	final		raw	final	
Aluminum	200	17										
Antimony	6.0	1.7										
Arsenic	3.0	2.1	1.90	<3.0		1.70	<3.0		0.600	<3.0		
Barium	200	.8										
Beryllium	1.0	.3										
Bismuth	20	2.3										
Boron	100	2.3										
Cadmium	3.0	.3										
Calcium	5000	6.6										
Cerium	100											
Chromium	10	.3										
Cobalt	50	.4										
Copper	10	.8										
Iron	100	5.3	6.90	<100		6.20	<100		5.00	<100		
Lead	3.0	1.1										
Lithium	50	4.8										
Magnesium	5000	32										
Manganese	15	.1										
Molybdenum	20	.6										
Nickel	10	.4										
Phosphorus	50	1.2										
Potassium	10000	77										
Selenium	10	3.2										
Silicon	200	1.7										
Silver	10	1										
Sodium	10000	34										
Strontium	10	.3										
Sulfur	50	3										
Thallium	10	1.8										
Tin	10	.8										
Titanium	10	.5										
Tungsten	50	2.6										
Vanadium	50	.6										



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:			10:20 CCB4		11:38 CCB5		12:08 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc 20 .1

Zirconium 10 .3

(\*) Outside of QC limits

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time: Sample ID:		07:19 ICV1		07:32 CCV1		08:32 CCV2			
Metal	ICV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony									
Arsenic	2000	2050	102.5	2000	1950	97.5	2000	1910	95.5
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Cerium									
Chromium									
Cobalt									
Copper									
Iron	40000	41100	102.8	40000	39600	99.0	40000	38600	96.5
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver									
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		07:19			07:32			08:32		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time: Sample ID:		09:35 CCV3		10:15 CCV4		11:29 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony									
Arsenic	2000	1880	94.0	2000	1860	93.0	2000	1830	91.5
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Cerium									
Chromium									
Cobalt									
Copper									
Iron	40000	37800	94.5	40000	36900	92.3	40000	35900	89.8*(a)
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver									
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		09:35			10:15			11:29		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

6.1.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		12:03	
Sample ID:		CCV	
Metal		CCV6	
		Results	% Rec
Aluminum			
Antimony			
Arsenic	2000	1810	90.5
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron	40000	35700	89.3*(a)
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:	12:03
Sample ID:	CCV
Metal	True
Results	% Rec

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52496 Units: ug/l

Time:		08:01			08:07		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony							
Arsenic	8000	7500	93.8				
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper							
Iron				200000	190000	95.0	
Lead							
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel							
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							



HIGH STANDARD CHECK SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52496      Units: ug/l

Time:		08:01		08:07		
Sample ID:		HSTD1		HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec

Zinc

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:41 CRID1	% Rec	07:46 CRI1	% Rec	08:22 CRI2	% Rec
Metal	True	True	True	Results		Results		Results	
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	2.60	86.7	7.70	96.3	8.30	103.8
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0						
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				108	108.0	104	104.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0						
Molybdenum	20								
Nickel	10		4.0						
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000						
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time:					07:41		07:46		08:22	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True							

Zinc 20 10

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	11:43 CRID2	% Rec	11:48 CRI3	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100				
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	3.50	116.7	7.40	92.5
Barium	200		4.0				
Beryllium	2.0		1.0				
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0				
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0				
Copper	10		2.0				
Iron	100	500				97.8	97.8
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0				
Molybdenum	20						
Nickel	10		4.0				
Phosphorus	50						
Potassium	5000		2000				
Selenium	10	20	5.0				
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000				
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time:					11:43		11:48	
Sample ID:	CRI	CRIA	CRID		CRID2		CRI3	
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc 20 10

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.6

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52496      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:51 ICSAB1 Results	% Rec	07:56 ICSAB1 Results	% Rec	11:53 ICSAB2 Results	% Rec	11:58 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	491000	98.2	482000	96.4	440000	88.0	440000	88.0
Antimony		1000	-2.40		955	95.5	-2.10		877	87.7
Arsenic		1000	-0.700		946	94.6	2.60		886	88.6
Barium		500	5.70		479	95.8	4.80		449	89.8
Beryllium		500	0.100		479	95.8	0.100		438	87.6
Bismuth		500	-14.2		472	94.4	-11.2		449	89.8
Boron		500	-0.500		469	93.8	-0.500		444	88.8
Cadmium		1000	1.50		990	99.0	1.50		920	92.0
Calcium	400000	400000	384000	96.0	385000	96.3	352000	88.0	352000	88.0
Cerium			79.8		543*		69.5		490*	
Chromium		500	1.80		465	93.0	1.70		426	85.2
Cobalt		500	1.00		476	95.2	0.500		445	89.0
Copper		500	6.00		491	98.2	3.90		455	91.0
Iron	200000	200000	202000	101.0	196000	98.0	184000	92.0	178000	89.0
Lead		1000	4.90*		924	92.4	1.30		854	85.4
Lithium		500	-6.90		467	93.4	-5.90		432	86.4
Magnesium	500000	500000	491000	98.2	485000	97.0	448000	89.6	444000	88.8
Manganese		500	1.10		492	98.4	1.50		455	91.0
Molybdenum		500	-2.70		456	91.2	-1.80		426	85.2
Nickel		1000	-8.60		912	91.2	-6.90		845	84.5
Phosphorus		500	-5.30		458	91.6	-9.90		428	85.6
Potassium			-451		-360		-283		-223	
Selenium		1000	-3.90		881	88.1	0.00		828	82.8
Silicon		500	6.10		510	102.0	5.00		474	94.8
Silver		1000	1.50		946	94.6	4.80		869	86.9
Sodium			110		97.0		136		124	
Strontium		500	-1.00		475	95.0	-1.00		442	88.4
Sulfur		500	28.5		487	97.4	49.1		477	95.4
Thallium		1000	0.200		914	91.4	-1.50		848	84.8
Tin		500	-5.80		453	90.6	-6.30		422	84.4
Titanium		500	-2.00		477	95.4	-1.60		433	86.6
Tungsten		500	-1.80		465	93.0	-0.800		432	86.4
Vanadium		500	-4.60		475	95.0	-5.90		450	90.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52496 Units: ug/l

Time:				07:51			07:56			11:53			11:58
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	3.10			917	91.7	2.80		844	84.4		
Zirconium		500	-1.00			431	86.2	-0.100		398	79.6*		

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	56.5	* (a)
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	5.3	32	7.2	<100
Lead	3.0	1.1	1.8		
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.3	4.1		

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) All reported results >3000x MB value.

## 6.2.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Page 1

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original MS	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F		Spikelot	% Rec	MSD	QC
	Original	MSD	MPSPK2		RPD	Limit
Aluminum						
Antimony						
Arsenic	1430000	1410000	2000	-1000.0a	0.7	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron	60300	82000	25000	86.8	0.1	20
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## 6.2.3 6

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Page 1

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	1430000	1490000	4.2	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	60300	62300	3.3	0-10
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04 PO#4862.04

SGS Job Number: JD45653

Sampling Date: 05/26/22



Report to:

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ATTN: Chelsey Shepsko

Total number of pages in report: 15



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD45653

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JD45653-1	05/26/22	08:00 MF	05/26/22	AQ	Ground Water	MW-607D_20220526
JD45653-2	05/26/22	10:10 MF	05/26/22	AQ	Ground Water	MW-560D_20220526
JD45653-3	05/26/22	11:11 MF	05/26/22	AQ	Ground Water	MW-559D_20220526

Summary of Hits

Job Number: JD45653  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 05/26/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD45653-1	MW-607D_20220526					
Sulfate		8.3	2.0		mg/l	EPA 300/SW846 9056A
Sulfide		3.5	2.0		mg/l	SM4500S2- F-11
JD45653-2	MW-560D_20220526					
Sulfate		263	2.0		mg/l	EPA 300/SW846 9056A
JD45653-3	MW-559D_20220526					
Sulfate		899	10		mg/l	EPA 300/SW846 9056A

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-607D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45653-1	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	8.3	2.0	mg/l	1	06/02/22 23:15	JD	EPA 300/SW846 9056A
Sulfide	3.5	2.0	mg/l	1	05/28/22 12:00	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45653-2	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	263	2.0	mg/l	1	06/02/22 23:28	JD	EPA 300/SW846 9056A
Sulfide	< 2.0	2.0	mg/l	1	05/28/22 12:00	MP	SM4500S2- F-11

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-559D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45653-3	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	899	10	mg/l	5	06/03/22 20:22	JD	EPA 300/SW846 9056A
Sulfide	< 2.0	2.0	mg/l	1	05/28/22 12:00	MP	SM4500S2- F-11

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody



## SGS Sample Receipt Summary

**Job Number:** JD45653

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 5/26/2022 4:48:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.0);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.7);

**Cooler Security**
**Y or N**
**Y or N**

- |  |  |
|--|--|
| 1. Custody Seals Present: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |  |
|---|--|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Cooler temp verification: IR Gun   |  |
| 3. Cooler media: Ice (Bag)  |  |
| 4. No. Coolers: 1   |  |

**Quality Control Preservation**
**Y or N**
**N/A**

- |   |  |
|---|--|
| 1. Trip Blank present / cooler: <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Trip Blank listed on COC: <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>    |  |
| 3. Samples preserved properly: <input checked="" type="checkbox"/> <input type="checkbox"/>                           |  |
| 4. VOCs headspace free: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>         |  |

**Sample Integrity - Documentation**
**Y or N**

- |   |  |
|---|--|
| 1. Sample labels present on bottles: <input checked="" type="checkbox"/> <input type="checkbox"/>   |  |
| 2. Container labeling complete: <input checked="" type="checkbox"/> <input type="checkbox"/>        |  |
| 3. Sample container label / COC agree: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |

**Sample Integrity - Condition**
**Y or N**

- |   |  |
|---|--|
| 1. Sample recvd within HT: <input checked="" type="checkbox"/> <input type="checkbox"/>       |  |
| 2. All containers accounted for: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 3. Condition of sample: Intact  |  |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |  |  |
|--|--|
| 1. Analysis requested is clear: <input checked="" type="checkbox"/> <input type="checkbox"/>                             |  |
| 2. Bottles received for unspecified tests: <input type="checkbox"/> <input checked="" type="checkbox"/>                  |  |
| 3. Sufficient volume recvd for analysis: <input checked="" type="checkbox"/> <input type="checkbox"/>                    |  |
| 4. Compositing instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 5. Filtering instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>   |  |

Test Strip Lot #s:	pH 1-12: 231619	pH 12+: 203117A	Other: (Specify)
--------------------	-----------------	-----------------	------------------

Comments

 SM089-03  
Rev. Date 12/7/17

JD45653: Chain of Custody

Page 2 of 2

## General Chemistry

5

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45653  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Sulfate	GP40473/GN29868	2.0	0.96	mg/l	80	87.9	109.9	90-110%
Sulfide	GN29715	2.0	0.0	mg/l	5	5.0	100.0	80-120%
Sulfide	GN29715			mg/l	10	9.9	99.0	80-120%

Associated Samples:  
Batch GN29715: JD45653-1, JD45653-2, JD45653-3  
Batch GP40473: JD45653-1, JD45653-2, JD45653-3  
(\*) Outside of QC limits

5.1  
5

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45653  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Sulfate	GP40473/GN29929	JD45556-6	mg/l	686	676	1.6	0-20%
Sulfide	GN29715	JD45598-2	mg/l	0.0	0.0	0.0	0-12%

Associated Samples:  
Batch GN29715: JD45653-1, JD45653-2, JD45653-3  
Batch GP40473: JD45653-1, JD45653-2, JD45653-3  
(\*) Outside of QC limits

5.2

5

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD45653  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Sulfate	GP40473/GN29929	JD45556-6	mg/l	686	80	758	90.0	80-120%
Sulfide	GN29715	JD45598-1	mg/l	0.0	3.33	2.9	87.1	37-135%

Associated Samples:

Batch GN29715: JD45653-1, JD45653-2, JD45653-3

Batch GP40473: JD45653-1, JD45653-2, JD45653-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04 PO#4862.04

SGS Job Number: JD45654

Sampling Date: 05/26/22



Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 48



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Sample Summary

Sunoco/Evergreen

Job No: JD45654

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45654-1F	05/26/22	08:00 MF	05/26/22	AQ	Groundwater Filtered	MW-607D_20220526
JD45654-2F	05/26/22	10:10 MF	05/26/22	AQ	Groundwater Filtered	MW-560D_20220526
JD45654-3F	05/26/22	11:10 MF	05/26/22	AQ	Groundwater Filtered	MW-559D_20220526
JD45654-4F	05/26/22	12:20 MF	05/26/22	AQ	Equip Blank Filtered	EB-01_20220526

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45654

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/6/2022 11:26:07 AM

On 05/26/2022, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45654 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33220

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45654-2FMS, JD45654-2FMSD, JD45654-2FSDL were used as the QC samples for metals.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Monday, June 06, 2022

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## Summary of Hits

Page 1 of 1

**Job Number:** JD45654  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 05/26/22



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
<b>JD45654-1F</b>	<b>MW-607D_20220526</b>					
Arsenic		111000	150		ug/l	SW846 6010D
Iron		56500	5000		ug/l	SW846 6010D
<b>JD45654-2F</b>	<b>MW-560D_20220526</b>					
Arsenic		14600	15		ug/l	SW846 6010D
Iron		52800	500		ug/l	SW846 6010D
<b>JD45654-3F</b>	<b>MW-559D_20220526</b>					
Arsenic		297	3.0		ug/l	SW846 6010D
Iron		41500	100		ug/l	SW846 6010D
<b>JD45654-4F</b>	<b>EB-01_20220526</b>					
Arsenic		11.3	3.0		ug/l	SW846 6010D

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-607D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-1F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	111000	150	ug/l	50	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	56500	5000	ug/l	50	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-2F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14600	15	ug/l	5	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	52800	500	ug/l	5	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220

RL = Reporting Limit

4.2  
4



Report of Analysis

<b>Client Sample ID:</b>	MW-559D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-3F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	297	3.0	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	41500	100	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220

RL = Reporting Limit

4.3  
4

Report of Analysis

<b>Client Sample ID:</b>	EB-01_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-4F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Equip Blank Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	11.3	3.0	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	< 100	100	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515

(2) Prep QC Batch: MP33220

RL = Reporting Limit

4.4  
4

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



## CHAIN OF CUSTODY

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SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL 732-329-0200 FAX: 732-329-3499/3490  
www.sgs.com/ehsusa

EHSA-OAC-0023-04-FORM-Standard COC

Client/Reporting Information		Project Information		Requested Analysis												Matrix Codes	
Company Name: <b>Sinborn Head &amp; Associates</b>		Project Name: <b>Evergreen AQI 7 MHIC</b>														<div>Matrix Codes</div> <div>DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SD - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank</div>	
Street Address: <b>20 Foundry St</b>		Street: <b>100 Green St</b>															
City: <b>Concord NH</b> State: <b>03301</b>		City: <b>Marcus Hook, PA</b> State: <b>18622</b>															
Project Contact: <b>Shane Whiting</b> E-mail: <b>shane@sinborn.com</b>		Project # <b>4862.04</b>															
Phone # <b>603-415-6159</b>		Client Purchase Order # <b>4862.04</b>															
Samples (Name(s)): <b>Michael Fiante</b> Phone # <b>262-418-7859</b>		Project Manager: <b>Chelsey Skopicki</b>															
Attention:																	
Turn Around Time (Business Days)		Approved By (SGS PM): / Date:		Deliverable		Comments / Special Instructions											
<input checked="" type="checkbox"/> 10 Business Days <input type="checkbox"/> 5 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 1 Business Day <input type="checkbox"/> Other		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NJ Reduced (Level 3) <input checked="" type="checkbox"/> Full Tier J (Level 4) <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ DKQP		<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> MA MCP Criteria <input type="checkbox"/> CT RCP Criteria <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <b>Stantec-Equis</b>		<input type="checkbox"/> DOD-QSMS											
All data available via Lablink		Approval needed for 1-3 Business Day TAT		Commercial "A" = Results only; Commercial "B" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Raw data		<a href="http://www.sgs.com/en/terms-and-conditions">http://www.sgs.com/en/terms-and-conditions</a>											
Sample Custody must be documented below each time samples change possession, including courier delivery.																	
Relinquished by: <b>Michael Fiante</b>	Date / Time: <b>5/26/22 10:00 AM</b>	Received By: <b>MARIO-IMAIL</b>	Date / Time: <b>5/26/22 02:30 PM</b>	Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:	Received By:	Date / Time:		
3		3		4		4		5		5		6		6			
5		5		5		5		5		5		5		5			
Custody Seal #		Intact <input type="checkbox"/> Not Intact <input type="checkbox"/> Absent <input type="checkbox"/>		Therm ID: <b>40</b>		On <input checked="" type="checkbox"/> Off <input type="checkbox"/>		Cooler Temp: <b>30.4</b>									
See Sample Receipt Summary																	

JD45654: Chain of Custody

Page 1 of 2



## SGS Sample Receipt Summary

**Job Number:** JD45654

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 5/26/2022 4:48:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.0);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.7);

**Cooler Security**
**Y or N**
**Y or N**

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

**Quality Control Preservation**
**Y or N**
**N/A**

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**
**Y or N**

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Sample Integrity - Condition**
**Y or N**

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Test Strip Lot #s:**

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

 SM089-03  
Rev. Date 12/7/17

JD45654: Chain of Custody

Page 2 of 2

Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD45654

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD45654-1F Collected: 26-MAY-22 08:00 By: MF Received: 26-MAY-22 By: DG MW-607D_20220526						
JD45654-1F SW846 6010D		03-JUN-22 13:57	ND	02-JUN-22 SF		AS,FE
JD45654-2F Collected: 26-MAY-22 10:10 By: MF Received: 26-MAY-22 By: DG MW-560D_20220526						
JD45654-2F SW846 6010D		03-JUN-22 13:48	ND	02-JUN-22 SF		AS,FE
JD45654-3F Collected: 26-MAY-22 11:10 By: MF Received: 26-MAY-22 By: DG MW-559D_20220526						
JD45654-3F SW846 6010D		03-JUN-22 14:07	ND	02-JUN-22 SF		AS,FE
JD45654-4F Collected: 26-MAY-22 12:20 By: MF Received: 26-MAY-22 By: DG EB-01_20220526						
JD45654-4F SW846 6010D		03-JUN-22 14:12	ND	02-JUN-22 SF		AS,FE

# SGS Internal Chain of Custody

Page 1 of 1

**Job Number:** JD45654  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 05/26/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD45654-1F.1	Christian King	Secured Staging Area	06/01/22 20:17	Return to Storage
JD45654-1F.1	Secured Staging Area	Alyssa Koshy	06/02/22 08:24	Retrieve from Storage
JD45654-1F.1	Alyssa Koshy	Secured Storage	06/02/22 13:12	Return to Storage
JD45654-1F.1.1	Alyssa Koshy	Metals Digestion	06/02/22 11:24	Digestate from JD45654-1F.1
JD45654-1F.1.1	Metals Digestion	Alyssa Koshy	06/02/22 11:24	Digestate from JD45654-1F.1
JD45654-1F.1.1	Alyssa Koshy	Metals Digestate Storage	06/02/22 11:24	Return to Storage
JD45654-2F.1	Christian King	Secured Staging Area	06/01/22 20:17	Return to Storage
JD45654-2F.1	Secured Staging Area	Alyssa Koshy	06/02/22 08:24	Retrieve from Storage
JD45654-2F.1	Alyssa Koshy	Secured Storage	06/02/22 13:12	Return to Storage
JD45654-2F.1.1	Alyssa Koshy	Metals Digestion	06/02/22 11:24	Digestate from JD45654-2F.1
JD45654-2F.1.1	Metals Digestion	Alyssa Koshy	06/02/22 11:24	Digestate from JD45654-2F.1
JD45654-2F.1.1	Alyssa Koshy	Metals Digestate Storage	06/02/22 11:24	Return to Storage
JD45654-3F.1	Christian King	Secured Staging Area	06/01/22 20:17	Return to Storage
JD45654-3F.1	Secured Staging Area	Alyssa Koshy	06/02/22 08:24	Retrieve from Storage
JD45654-3F.1	Alyssa Koshy	Secured Storage	06/02/22 13:12	Return to Storage
JD45654-3F.1.1	Alyssa Koshy	Metals Digestion	06/02/22 11:24	Digestate from JD45654-3F.1
JD45654-3F.1.1	Metals Digestion	Alyssa Koshy	06/02/22 11:24	Digestate from JD45654-3F.1
JD45654-3F.1.1	Alyssa Koshy	Metals Digestate Storage	06/02/22 11:24	Return to Storage
JD45654-4F.1	Christian King	Secured Staging Area	06/01/22 20:17	Return to Storage
JD45654-4F.1	Secured Staging Area	Alyssa Koshy	06/02/22 08:24	Retrieve from Storage
JD45654-4F.1	Alyssa Koshy	Secured Storage	06/02/22 13:12	Return to Storage
JD45654-4F.1	Secured Storage	Todd Shoemaker	06/03/22 15:10	Retrieve from Storage
JD45654-4F.1	Todd Shoemaker	Secured Staging Area	06/03/22 15:10	Return to Storage
JD45654-4F.1.1	Alyssa Koshy	Metals Digestion	06/02/22 11:24	Digestate from JD45654-4F.1
JD45654-4F.1.1	Metals Digestion	Alyssa Koshy	06/02/22 11:24	Digestate from JD45654-4F.1
JD45654-4F.1.1	Alyssa Koshy	Metals Digestate Storage	06/02/22 11:24	Return to Storage

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52515  
Parameters: As,Fe

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:11	MA52515-STD1	1		STDA
12:16	MA52515-STD2	1		STDB
12:21	MA52515-ICV1	1		
12:29	MA52515-ICB1	1		
12:34	MA52515-CCV1	1		
12:38	MA52515-CCB1	1		
12:43	MA52515-CRID1	1		
12:48	MA52515-CRI1	1		
12:53	MA52515-ICSA1	1		
12:58	MA52515-ICSAB1	1		
13:03	MA52515-HSTD1	1		
13:09	MA52515-HSTD2	1		
13:16	MP33220-S1	5		
13:20	MP33220-S2	5		
13:25	ZZZZZZ	25		
13:33	MA52515-CCV2	1		
13:38	MA52515-CCB2	1		
13:43	MP33220-MB1	1		
13:48	JD45654-2F	5		
13:52	MP33220-SD1	25		
13:57	JD45654-1F	50		
14:02	MP33220-B1	1		
14:07	JD45654-3F	1		
14:12	JD45654-4F	1		undigested confirmed on ma52519
14:18	JD45654-3F	5		
----->	Last reportable sample/prep for job JD45654			
14:23	ZZZZZZ	1		
14:28	MA52515-CCV3	1		
14:33	MA52515-CCB3	1		
14:38	MA52515-CRI2	1		
14:43	MA52515-CRID2	1		
14:48	MA52515-ICSA2	1		
14:53	MA52515-ICSAB2	1		
14:58	MP33185-S1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:04	MP33185-S2	1		
15:09	JD45438-2F	1		(sample used for QC only; not part of login JD45654)
15:14	MP33185-SD1	5		
15:19	ZZZZZZ	1		
15:27	MA52515-CCV4	1		
15:31	MA52515-CCB4	1		
----->	Last reportable CCB for job JD45654			
15:36	ZZZZZZ	1		
15:42	ZZZZZZ	1		
15:47	ZZZZZZ	1		
15:52	ZZZZZZ	1		
15:57	ZZZZZZ	1		
16:02	MA52515-CCV5	1		
16:10	MA52515-CCB5	1		
16:15	MA52515-CRI3	1		
16:20	MA52515-ICSA3	1		
16:25	MA52515-ICSAB3	1		
16:30	MA52515-CCV6	1		
16:35	MA52515-CCB6	1		
16:40	ZZZZZZ	1		
16:45	ZZZZZZ	1		
16:50	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Dilution	A F s e
12:21	MA52515-ICV1	1	X X
12:29	MA52515-ICB1	1	X X
12:34	MA52515-CCV1	1	X X
12:38	MA52515-CCB1	1	X X
12:43	MA52515-CRID1	1	X X
12:48	MA52515-CRI1	1	X X
12:53	MA52515-ICSA1	1	X X
12:58	MA52515-ICSAB1	1	X X
13:03	MA52515-HSTD1	1	X X
13:09	MA52515-HSTD2	1	X X
13:16	MP33220-S1	5	X X
13:20	MP33220-S2	5	X X
13:25	ZZZZZZ	25	
13:33	MA52515-CCV2	1	X X
13:38	MA52515-CCB2	1	X X
13:43	MP33220-MB1	1	X X
13:48	JD45654-2F	5	X X
13:52	MP33220-SD1	25	X X
13:57	JD45654-1F	50	X X
14:02	MP33220-B1	1	X X
14:07	JD45654-3F	1	X X
14:12	JD45654-4F	1	X X
14:18	JD45654-3F	5	
14:23	ZZZZZZ	1	
14:28	MA52515-CCV3	1	X X
14:33	MA52515-CCB3	1	X X
14:38	MA52515-CRI2	1	X X
14:43	MA52515-CRID2	1	X X
14:48	MA52515-ICSA2	1	X X
14:53	MA52515-ICSAB2	1	X X
14:58	MP33185-S1	1	X
15:04	MP33185-S2	1	X
15:09	JD45438-2F	1	X (a)
		Element:	A F s e

# REPORTED ELEMENTS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Dilution	A F s e
15:14	MP33185-SD1	5	X
15:19	ZZZZZZ	1	
15:27	MA52515-CCV4	1	X X
15:31	MA52515-CCB4	1	X X
15:36	ZZZZZZ	1	
15:42	ZZZZZZ	1	
15:47	ZZZZZZ	1	
15:52	ZZZZZZ	1	
15:57	ZZZZZZ	1	
16:02	MA52515-CCV5	1	X X
16:10	MA52515-CCB5	1	X X
16:15	MA52515-CRI3	1	X X
16:20	MA52515-ICSA3	1	X X
16:25	MA52515-ICSAB3	1	X X
16:30	MA52515-CCV6	1	X X
16:35	MA52515-CCB6	1	X X
16:40	ZZZZZZ	1	
16:45	ZZZZZZ	1	
16:50	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45654.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:11	MA52515-STD1	5447 R	170800 R	17890 R	10639 R
12:16	MA52515-STD2	5199	161480	17783	9473
12:21	MA52515-ICV1	5276	163330	17707	9759
12:29	MA52515-ICB1	5385	170350	17903	10582
12:34	MA52515-CCV1	5337	165140	17913	9821
12:38	MA52515-CCB1	5429	170500	17947	10639
12:43	MA52515-CRID1	5422	171200	17932	10620
12:48	MA52515-CRI1	5362	168100	17734	10464
12:53	MA52515-ICSA1	4988	153240	17706	8890
12:58	MA52515-ICSAB1	4995	153440	17901	8896
13:03	MA52515-HSTD1	5410	170820	18103	10503
13:09	MA52515-HSTD2	5027	155540	17655	8915
13:16	MP33220-S1	5349	166980	17855	10138
13:20	MP33220-S2	5397	168410	18091	10205
13:25	ZZZZZZ	5437	169920	18235	10417
13:33	MA52515-CCV2	5353	166280	17762	9887
13:38	MA52515-CCB2	5455	170830	17843	10739
13:43	MP33220-MB1	5522	175690	18492	10838
13:48	JD45654-2F	5468	171220	18311	10420
13:52	MP33220-SD1	5518	172940	18198	10716
13:57	JD45654-1F	5519	171650	18154	10782
14:02	MP33220-B1	5450	170220	18352	10221
14:07	JD45654-3F	5010	155560	18004	9023
14:12	JD45654-4F	5571	176380	18618	10952
14:18	JD45654-3F	5362	167910	18242	9978
14:23	ZZZZZZ	5440	170230	18248	10820
14:28	MA52515-CCV3	5423	168050	18137	10011
14:33	MA52515-CCB3	5445	172030	17895	10746
14:38	MA52515-CRI2	5488	172200	18115	10680
14:43	MA52515-CRID2	5542	173630	18266	10847
14:48	MA52515-ICSA2	5125	155980	18158	9136
14:53	MA52515-ICSAB2	5145	156900	18112	9145
14:58	MP33185-S1	4923	155420	17956	8866

## INTERNAL STANDARD SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:04	MP33185-S2	4871	154140	17715	8806
15:09	JD45438-2F	4933	154930	17970	8904
15:14	MP33185-SD1	5421	170310	18540	10072
15:19	ZZZZZZ	5482	172050	18819	10197
15:27	MA52515-CCV4	5590	173350	18743	10284
15:31	MA52515-CCB4	5574	176300	18412	10972
15:36	ZZZZZZ	4867	153810	17828	8787
15:42	ZZZZZZ	5558	174960	18811	10546
15:47	ZZZZZZ	5678	178540	19210	10742
15:52	ZZZZZZ	5741	179150	18997	10813
15:57	ZZZZZZ	5739	180070	19030	11270
16:02	MA52515-CCV5	5513	173210	18730	10189
16:10	MA52515-CCB5	5671	177910	18245	11127
16:15	MA52515-CRI3	5661	177000	18545	10968
16:20	MA52515-ICSA3	5252	160780	18517	9326
16:25	MA52515-ICSAB3	5135	157850	17996	9173
16:30	MA52515-CCV6	5581	171700	18361	10279
16:35	MA52515-CCB6	5710	178760	18652	11180
16:40	ZZZZZZ	5541	175480	18314	11104
16:45	ZZZZZZ	5616	176710	18247	11051
16:50	ZZZZZZ	5744	180800	18769	11282

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:				12:29 ICB1			12:38 CCB1			13:38 CCB2			14:33 CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final	raw	final	raw	final	
Aluminum	200	17													
Antimony	6.0	1.7	anr												
Arsenic	3.0	2.1	0.00	<3.0	-0.200	<3.0	-0.900	<3.0	0.600	<3.0					
Barium	200	.8	anr												
Beryllium	1.0	.3	anr												
Bismuth	20	2.3													
Boron	100	2.3													
Cadmium	3.0	.3	anr												
Calcium	5000	6.6													
Cerium	100														
Chromium	10	.3													
Cobalt	50	.4													
Copper	10	.8	anr												
Iron	100	5.3	-2.00	<100	-3.30	<100	-0.200	<100	0.400	<100					
Lead	3.0	1.1	anr												
Lithium	50	4.8													
Magnesium	5000	32													
Manganese	15	.1	anr												
Molybdenum	20	.6													
Nickel	10	.4	anr												
Phosphorus	50	1.2													
Potassium	10000	77	anr												
Selenium	10	3.2	anr												
Silicon	200	1.7													
Silver	10	1	anr												
Sodium	10000	34	anr												
Strontium	10	.3													
Sulfur	50	3													
Thallium	10	1.8	anr												
Tin	10	.8	anr												
Titanium	10	.5													
Tungsten	50	2.6													
Vanadium	50	.6													

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:		15:31 CCB4		
Metal	RL	IDL	raw	final
Aluminum	200	17		
Antimony	6.0	1.7	anr	
Arsenic	3.0	2.1	3.30	* (a)
Barium	200	.8	anr	
Beryllium	1.0	.3	anr	
Bismuth	20	2.3		
Boron	100	2.3		
Cadmium	3.0	.3	anr	
Calcium	5000	6.6		
Cerium	100			
Chromium	10	.3		
Cobalt	50	.4		
Copper	10	.8	anr	
Iron	100	5.3	1.10	<100
Lead	3.0	1.1	anr	
Lithium	50	4.8		
Magnesium	5000	32		
Manganese	15	.1	anr	
Molybdenum	20	.6		
Nickel	10	.4	anr	
Phosphorus	50	1.2		
Potassium	10000	77	anr	
Selenium	10	3.2	anr	
Silicon	200	1.7		
Silver	10	1	anr	
Sodium	10000	34	anr	
Strontium	10	.3		
Sulfur	50	3		
Thallium	10	1.8	anr	
Tin	10	.8	anr	
Titanium	10	.5		
Tungsten	50	2.6		
Vanadium	50	.6		

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time:		15:31		
Sample ID:		CCB4		
Metal	RL	IDL	raw	final

Zinc 20 .1 anr

Zirconium 10 .3

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:		12:21 ICV1	% Rec	12:34 CCV1	% Rec	13:33 CCV2	% Rec
Metal	ICV	Results		True	Results	True	Results
Aluminum							
Antimony	anr						
Arsenic	2000	1980	99.0	2000	1960	98.0	2000
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	40000	40700	101.8	40000	39300	98.3	40000
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin	anr						
Titanium							
Tungsten							
Vanadium							

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:		14:28 CCV3		15:27 CCV4		
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	anr					
Arsenic	2000	1880	94.0	2000	1840	92.0
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron	40000	37700	94.3	40000	36600	91.5
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin	anr					
Titanium						
Tungsten						
Vanadium						

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28			15:27		
Sample ID:	CCV	CCV3		CCV	CCV4		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

## HIGH STANDARD CHECK SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 06/03/22  
Run ID: MA52515

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		13:03			13:09		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	8000	7450	93.1				
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron				200000	186000	93.0	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver	anr						
Sodium							
Strontium							
Sulfur							
Thallium	anr						
Tin	anr						
Titanium							
Tungsten							
Vanadium							

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03			13:09		
Sample ID:		HSTD	HSTD1	HSTD	HSTD2		
Metal		True	Results	% Rec	True	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.5

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	12:43 CRID1	% Rec	12:48 CRI1	% Rec	14:38 CRI2	% Rec
Metal	True	True	True	Results		Results		Results	
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	3.50	116.7	7.80	97.5	7.50	93.8
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				99.3	99.3	95.5	95.5
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					12:43		12:48		14:38	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True							

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:43 CRID2	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100		
Antimony	6.0	20	3.0		
Arsenic	8.0	20	3.0	3.10	103.3
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	anr	
Calcium	5000	2000	1000		
Cerium					
Chromium	10		2.0		
Cobalt	50		3.0		
Copper	10		2.0		
Iron	100	500			
Lead	3.0	20	2.5		
Lithium	50				
Magnesium	5000	2000	100		
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0		
Silicon	200				
Silver	5.0		2.0		
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0		
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0		

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:				14:43	
Sample ID:	CRI	CRIA	CRID	CRID2	
Metal	True	True	True	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.6  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	12:53 ICSAB1 Results	% Rec	12:58 ICSAB1 Results	% Rec	14:48 ICSAB2 Results	% Rec	14:53 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	478000	95.6	471000	94.2	455000	91.0	458000	91.6
Antimony		1000	1.90		927	92.7	4.20		899	89.9
Arsenic		1000	-1.30		940	94.0	-1.00		904	90.4
Barium		500	5.90		465	93.0	5.40		447	89.4
Beryllium		500	0.200		461	92.2	0.200		449	89.8
Bismuth		500	-16.3		470	94.0	-16.8		449	89.8
Boron		500	0.500		465	93.0	-0.200		448	89.6
Cadmium		1000	-0.800		981	98.1	-1.20		944	94.4
Calcium	400000	400000	377000	94.3	376000	94.0	357000	89.3	364000	91.0
Cerium			144*		605*		141*		584*	
Chromium		500	5.40		465	93.0	4.60		451	90.2
Cobalt		500	1.10		469	93.8	1.30		453	90.6
Copper		500	1.20		482	96.4	1.10		470	94.0
Iron	200000	200000	197000	98.5	192000	96.0	189000	94.5	185000	92.5
Lead		1000	1.70		901	90.1	-1.90		873	87.3
Lithium		500	-5.50		455	91.0	-8.10		437	87.4
Magnesium	500000	500000	479000	95.8	477000	95.4	464000	92.8	462000	92.4
Manganese		500	-1.90		483	96.6	-2.30		468	93.6
Molybdenum		500	-2.80		454	90.8	-2.30		437	87.4
Nickel		1000	-3.70		896	89.6	-3.90		866	86.6
Phosphorus		500	-2.40		451	90.2	-2.00		433	86.6
Potassium			-601		-590		-606		-567	
Selenium		1000	-4.50		875	87.5	0.800		846	84.6
Silicon		500	3.40		505	101.0	4.10		489	97.8
Silver		1000	1.50		947	94.7	0.200		921	92.1
Sodium			110		127		149		126	
Strontium		500	-0.900		464	92.8	-0.800		448	89.6
Sulfur		500	24.0		484	96.8	20.5		474	94.8
Thallium		1000	-3.70		882	88.2	-2.90		852	85.2
Tin		500	-5.70		450	90.0	-5.50		436	87.2
Titanium		500	-1.80		471	94.2	-1.60		457	91.4
Tungsten		500	-2.30		462	92.4	-2.50		443	88.6
Vanadium		500	1.70		474	94.8	2.50		460	92.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				12:53			12:58			14:48			14:53
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1			ICSAB1			ICSAB2			ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	-3.40			906	90.6	-3.10		874	87.4		
Zirconium		500	-7.00			428	85.6	-7.00		415	83.0		

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/02/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	-0.40	<3.0
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	5.3	32	4.8	<100
Lead	3.0	1.1	1.8		
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/02/22

Metal	RL	IDL	MDL	MB raw	final
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Zinc 20 .1 6.9

Zirconium 10 .3 4.1

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	14600	16400	2000	90.0 75-125
Barium	anr			
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	52800	79000	25000	104.8 75-125
Lead	anr			
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin	anr			
Titanium				
Tungsten				
Vanadium				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MS	Spikelet MPSPK2	% Rec	QC Limits
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Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	14600	16800	2000	110.0	2.4	20
Barium	anr					
Beryllium						
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron	52800	79600	25000	107.2	0.8	20
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver						
Sodium	anr					
Strontium						
Sulfur						
Thallium						
Tin	anr					
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45654

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1870	2000	93.5	80-120
Barium	anr			
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	24700	25000	98.8	80-120
Lead	anr			
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin	anr			
Titanium				
Tungsten				
Vanadium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	14600	14700	0.8	0-10	
Barium	anr				
Beryllium					
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium					
Cobalt					
Copper	anr				
Iron	52800	54500	3.2	0-10	
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver					
Sodium	anr				
Strontium					
Sulfur					
Thallium					
Tin	anr				
Titanium					
Tungsten					
Vanadium					

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F	QC
	Original SDL 5:25 %DIF	Limits

Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.4

6



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD46072

Sampling Date: 06/03/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 52



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink, appearing to read 'D. Chastain'.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD46072

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD46072-1	06/03/22	09:30	MDL	06/03/22	AQ Ground Water	MW-56D_20220603
JD46072-1F	06/03/22	09:30	MDL	06/03/22	AQ Groundwater Filtered	MW-56D_20220603
JD46072-2	06/03/22	08:30	MDL	06/03/22	AQ Ground Water	MW-560D_20220603
JD46072-2F	06/03/22	08:30	MDL	06/03/22	AQ Groundwater Filtered	MW-560D_20220603
JD46072-3	06/03/22	09:00	MDL	06/03/22	AQ Ground Water	MW-606S_20220603
JD46072-3F	06/03/22	09:00	MDL	06/03/22	AQ Groundwater Filtered	MW-606S_20220603
JD46072-4	06/03/22	08:45	MDL	06/03/22	AQ Ground Water	MW-608D_20220603
JD46072-4F	06/03/22	08:45	MDL	06/03/22	AQ Groundwater Filtered	MW-608D_20220603
JD46072-5	06/03/22	09:15	MDL	06/03/22	AQ Ground Water	MW-609D_20220603
JD46072-5F	06/03/22	09:15	MDL	06/03/22	AQ Groundwater Filtered	MW-609D_20220603

## Summary of Hits

**Job Number:** JD46072  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/03/22

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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### JD46072-1 MW-56D\_20220603

No hits reported in this sample.

### JD46072-1F MW-56D\_20220603

Arsenic	258000	300	ug/l	SW846 6010D
Iron	55600	100	ug/l	SW846 6010D
Manganese	1220	15	ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	1.3	0.25	mg/l	EPA 365.3

### JD46072-2 MW-560D\_20220603

Sulfate	383	2.0	mg/l	EPA 300/SW846 9056A
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### JD46072-2F MW-560D\_20220603

Iron	10400	100	ug/l	SW846 6010D
Manganese	237	15	ug/l	SW846 6010D

### JD46072-3 MW-606S\_20220603

Sulfate	2560	24	mg/l	EPA 300/SW846 9056A
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### JD46072-3F MW-606S\_20220603

Iron	55400	100	ug/l	SW846 6010D
Manganese	1700	15	ug/l	SW846 6010D

### JD46072-4 MW-608D\_20220603

Sulfate	2100	20	mg/l	EPA 300/SW846 9056A
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### JD46072-4F MW-608D\_20220603

Arsenic	680000	300	ug/l	SW846 6010D
Iron	64400	100	ug/l	SW846 6010D
Manganese	1980	15	ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	3.6	0.50	mg/l	EPA 365.3

### JD46072-5 MW-609D\_20220603

Sulfate	1970	18	mg/l	EPA 300/SW846 9056A
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Summary of Hits

Job Number: JD46072  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 06/03/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						
JD46072-5F	MW-609D_20220603					
Arsenic		564000	300		ug/l	SW846 6010D
Iron		83000	100		ug/l	SW846 6010D
Manganese		1320	15		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		3.5	0.50		mg/l	EPA 365.3

(a) Lab filtration performed out of hold time.

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-1	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	< 2.0	2.0	mg/l	1	06/09/22 16:59	JD	EPA 300/SW846 9056A

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-1F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	258000	300	ug/l	100	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	55600	100	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	1220	15	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52551  
(2) Prep QC Batch: MP33360

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-1F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.3	0.25	mg/l	1	06/04/22 12:30	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-2	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	383	2.0	mg/l	1	06/09/22 17:12	JD	EPA 300/SW846 9056A

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-2F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	< 6.0	6.0	ug/l	1	06/15/22	06/16/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	10400	100	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	237	15	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52551
  - (2) Instrument QC Batch: MA52588
  - (3) Prep QC Batch: MP33360
  - (4) Prep QC Batch: MP33475
- (a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-2F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	1	06/04/22 12:30	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-3	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	2560	24	mg/l	12	06/10/22 12:01	JD	EPA 300/SW846 9056A

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-3F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	< 30	30	ug/l	10	06/15/22	06/16/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	55400	100	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	1700	15	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52551
  - (2) Instrument QC Batch: MA52588
  - (3) Prep QC Batch: MP33360
  - (4) Prep QC Batch: MP33475
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-3F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	1	06/04/22 12:30	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-4	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	2100	20	mg/l	10	06/10/22 12:14	JD	EPA 300/SW846 9056A

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-4F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	680000	300	ug/l	100	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	64400	100	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	1980	15	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52551  
(2) Prep QC Batch: MP33360

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-4F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	3.6	0.50	mg/l	1	06/04/22 12:30	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-5	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1970	18	mg/l	9	06/10/22 12:27	JD	EPA 300/SW846 9056A

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-5F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	564000	300	ug/l	100	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	83000	100	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Manganese	1320	15	ug/l	1	06/09/22	06/10/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52551  
(2) Prep QC Batch: MP33360

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220603	<b>Date Sampled:</b>	06/03/22
<b>Lab Sample ID:</b>	JD46072-5F	<b>Date Received:</b>	06/03/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	3.5	0.50	mg/l	1	06/04/22 12:30	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

**CHAIN OF CUSTODY**  
SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL. 732-329-0200 FAX 732-329-3499

Page 1 of 1 **JD46072**

Please merge with SDG:

SGS Order # 2022-544

SGS Job #

Matrix Codes

DW - Drinking Water  
GW - Ground Water  
WW - Wastewater  
SW - Surface Water  
SO - Soil  
SL - Sludge  
SED - Sediment  
OI - Oil  
LIQ - Other Liquid  
AIR - Air  
SOL - Other Solid  
WP - Wastes  
FB - Field Blank  
EB - Equipment Blank  
RB - Rinse Blank  
TB - Trip Blank

Lab Sample #

Field ID / Point of Collection

MEOHDI Val #

Date

Time

Sampled by

Matrix

# of bottles

Q

Q1

Q2

Q3

Q4

Q5

Q6

Q7

Q8

Q9

Q10

Q11

Q12

Q13

Q14

Q15

Q16

Q17

Q18

Q19

Q20

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## SGS Sample Receipt Summary

Job Number: JD46072

Client: \_\_\_\_\_

Project: \_\_\_\_\_

Date / Time Received: 6/3/2022 5:40:00 PM

Delivery Method: \_\_\_\_\_

Airbill #s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (3.4);

Cooler Temps (Corrected) °C: Cooler 1: (3.1);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
Rev. Date 12/7/17

JD46072: Chain of Custody

Page 2 of 3



Job Change Order: JD46072

Requested Date:	6/7/2022	Received Date:	6/3/2022
Account Name:	Sunoco/Evergreen	Due Date:	6/7/2022
Project Description:	SANHPAFW: Marcus Hook, PA	Deliverable:	COMMB
C/O Initiated By:	VICKYP	PM:	VP
		TAT (Days):	7

=====

Sample #:	JD46072-All	Change:	
Dept:			Please change the last character on the sample IDs to a '3' instead of so we match the sample date
TAT:	7		

=====

## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/09/22 06/09/22

Metal	RL	IDL	MDL	MB raw	final	MB raw	final
Aluminum	200	9.2	150				
Antimony	6.0	2.8	4.7				
Arsenic	3.0	2.6	2.8	-1.1	<3.0	0.70	<3.0
Barium	200	.2	13				
Beryllium	1.0	.2	.5				
Bismuth	20	2.5	8.6				
Boron	100	1.8	10				
Cadmium	3.0	.4	1				
Calcium	5000	13	99				
Cerium	100						
Chromium	10	.7	2				
Cobalt	50	.6	2.6				
Copper	10	.7	5.9				
Iron	100	3.3	32	12.0	<100	9.6	<100
Lead	3.0	2	1.8				
Lithium	50	1.5	7.3				
Magnesium	5000	25	140				
Manganese	15	.1	1.4	0.10	<15	0.10	<15
Molybdenum	20	.6	3.6				
Nickel	10	.8	1.7				
Phosphorus	50	7	18				
Potassium	10000	35	200				
Selenium	10	3.6	4.9				
Silicon	200	2.2	32				
Silver	10	.6	6.1				
Sodium	10000	14	570				
Strontium	10	.1	2.7				
Sulfur	50	3.7	45				
Thallium	10	5.2	1.8				
Tin	10	1.4	3.7				
Titanium	10	.8	2.5				
Tungsten	50	1.3	40				
Vanadium	50	.5	1.8				

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/09/22 06/09/22

Metal	RL	IDL	MDL	MB raw	final	MB raw	final
-------	----	-----	-----	-----------	-------	-----------	-------

Zinc 20 .3 6.9

Zirconium 10 .5 4.1

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original MS	Spikelot MPSPK2	% Rec	QC Limits	
Aluminum	anr				
Antimony	anr				
Arsenic	10.3	1950	2000	97.0	75-125
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	938	26500	25000	102.2	75-125
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	86.6	2050	2000	98.2	75-125
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original MS	Spikelet MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	10.3	1960	2000	97.5	0.5	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	938	26700	25000	103.0	0.8	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	86.6	2090	2000	100.2	1.9	20
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc anr

Zirconium

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46072

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/09/22

06/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr							
Antimony	anr							
Arsenic	1940	2000	97.0	80-120	1920	2000	96.0	80-120
Barium	anr							
Beryllium	anr							
Bismuth								
Boron								
Cadmium	anr							
Calcium	anr							
Cerium								
Chromium	anr							
Cobalt	anr							
Copper	anr							
Iron	25800	25000	103.2	80-120	25700	25000	102.8	80-120
Lead	anr							
Lithium								
Magnesium	anr							
Manganese	2000	2000	100.0	80-120	2000	2000	100.0	80-120
Molybdenum								
Nickel	anr							
Phosphorus								
Potassium	anr							
Selenium	anr							
Silicon								
Silver	anr							
Sodium	anr							
Strontium								
Sulfur								
Thallium	anr							
Tin								
Titanium								
Tungsten								
Vanadium	anr							

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

06/09/22

06/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46072

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1970	2000	98.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	26200	25000	104.8	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	2050	2000	102.5	80-120
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

## 5.1.3

ת

06/09/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc                      anr

Zirconium

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	10.3	0.00	100.0 (a)	0-10
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	938	1000	6.9	0-10
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	86.6	89.5	3.3	0-10
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33360  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/09/22

Metal	JD46008-6F Original SDL 1:5	%DIF	QC Limits
-------	--------------------------------	------	--------------

Zinc anr

Zirconium

Associated samples MP33360: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/15/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	27	150		
Antimony	6.0	2.2	4.7		
Arsenic	3.0	1.3	2.8	0.40	<3.0
Barium	200	1	13		
Beryllium	1.0	.2	.5		
Bismuth	20	2.1	8.6		
Boron	100	1	10		
Cadmium	3.0	.2	1		
Calcium	5000	7.7	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.4	2.6		
Copper	10	6.8	5.9		
Iron	100	15	32		
Lead	3.0	1.6	1.8		
Lithium	50	3.7	7.3		
Magnesium	5000	54	140		
Manganese	15	.1	1.4		
Molybdenum	20	.5	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	1.8	18		
Potassium	10000	77	200		
Selenium	10	2	4.9		
Silicon	200	1.3	32		
Silver	10	.9	6.1		
Sodium	10000	23	570		
Strontium	10	.4	2.7		
Sulfur	50	4.1	45		
Thallium	10	1.6	1.8		
Tin	10	.9	3.7		
Titanium	10	.9	2.5		
Tungsten	50	2	40		
Vanadium	50	.8	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/15/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .2 6.9

Zirconium 10 .5 4.1

Associated samples MP33475: JD46072-2F, JD46072-3F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	0.0	3930	4000	98.3 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F Original MS	Spikelet MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33475: JD46072-2F, JD46072-3F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F Original MSD	Spikelot MPSPK2		% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	0.0	3890	4000	97.3	1.0	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron	anr					
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	anr					
Lithium	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc anr

Zirconium

Associated samples MP33475: JD46072-2F, JD46072-3F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46072

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/15/22

06/15/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr							
Antimony	anr							
Arsenic	1910	2000	95.5	80-120	1910	2000	95.5	80-120
Barium	anr							
Beryllium	anr							
Bismuth								
Boron	anr							
Cadmium	anr							
Calcium	anr							
Cerium								
Chromium	anr							
Cobalt	anr							
Copper	anr							
Iron	anr							
Lead	anr							
Lithium	anr							
Magnesium	anr							
Manganese	anr							
Molybdenum								
Nickel	anr							
Phosphorus								
Potassium	anr							
Selenium	anr							
Silicon								
Silver	anr							
Sodium	anr							
Strontium								
Sulfur								
Thallium	anr							
Tin								
Titanium								
Tungsten								
Vanadium	anr							

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22 06/15/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33475: JD46072-2F, JD46072-3F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	0.00	0.00	NC	0-10
Barium	anr			
Beryllium	anr			
Bismuth				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD46072  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33475  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/15/22

Metal	JD46072-2F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc anr

Zirconium

Associated samples MP33475: JD46072-2F, JD46072-3F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

5.2.4

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## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP40609/GN30132	2.0	0.0	mg/l	80	87.8	109.8	90-110%
Phosphate, Ortho	GN29944	0.050	0.0	mg/l	0.2	0.19	95.0	90-110%
Sulfate	GP40609/GN30132	2.0	0.0	mg/l	80	87.9	109.9	90-110%

Associated Samples:  
Batch GN29944: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F  
Batch GP40609: JD46072-1, JD46072-2, JD46072-3, JD46072-4, JD46072-5  
(\*) Outside of QC limits

6.1  
6

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP40609/GN30132	JD46041-5	mg/l	36.2	35.8	1.1	0-20%
Phosphate, Ortho	GN29944	JD46051-1F	mg/l	0.0	0.0	0.0	0-23%
Sulfate	GP40609/GN30132	JD46041-5	mg/l	2.5	2.5	0.0	0-20%

Associated Samples:

Batch GN29944: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Batch GP40609: JD46072-1, JD46072-2, JD46072-3, JD46072-4, JD46072-5

(\*) Outside of QC limits

6.2

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MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46072  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP40609/GN30132	JD46041-5	mg/l	36.2	80	124	109.8	80-120%
Phosphate, Ortho	GN29944	JD46051-1F	mg/l	0.0	0.2	0.20	100.0	25-150%
Sulfate	GP40609/GN30132	JD46041-5	mg/l	2.5	80	87.1	105.8	80-120%

Associated Samples:

Batch GN29944: JD46072-1F, JD46072-2F, JD46072-3F, JD46072-4F, JD46072-5F

Batch GP40609: JD46072-1, JD46072-2, JD46072-3, JD46072-4, JD46072-5

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD46523

Sampling Date: 06/09/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 29



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink, appearing to read "D. Chastain".

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD46523

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD46523-1	06/09/22	08:00	CSS	06/09/22	AQ Ground Water	MW-608D_A_20220609
JD46523-1F	06/09/22	08:00	CSS	06/09/22	AQ Groundwater Filtered	MW-608D_A_20220609
JD46523-2	06/09/22	08:15	CSS	06/09/22	AQ Ground Water	MW-608D_B_20220609
JD46523-2F	06/09/22	08:15	CSS	06/09/22	AQ Groundwater Filtered	MW-608D_B_20220609
JD46523-3	06/09/22	08:30	CSS	06/09/22	AQ Ground Water	MW-609D_A_20220609
JD46523-3F	06/09/22	08:30	CSS	06/09/22	AQ Groundwater Filtered	MW-609D_A_20220609
JD46523-4	06/09/22	08:45	CSS	06/09/22	AQ Ground Water	MW-609D_B_20220609
JD46523-4F	06/09/22	08:45	CSS	06/09/22	AQ Groundwater Filtered	MW-609D_B_20220609

## Summary of Hits

Page 1 of 1

**Job Number:** JD46523  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/09/22

Lab Sample ID	Client Sample ID	Result/ Analyte Qual	RL	MDL	Units	Method
<b>JD46523-1</b>	<b>MW-608D_A_20220609</b>					
Sulfate		1730	16		mg/l	EPA 300/SW846 9056A
Sulfide		2.4	2.0		mg/l	SM4500S2- F-11
<b>JD46523-1F</b>	<b>MW-608D_A_20220609</b>					
Arsenic <sup>a</sup>		82200	500		ug/l	SW846 6010D
Iron <sup>a</sup>		47800	300		ug/l	SW846 6010D
<b>JD46523-2</b>	<b>MW-608D_B_20220609</b>					
Sulfate		1800	16		mg/l	EPA 300/SW846 9056A
Sulfide		4.3	2.0		mg/l	SM4500S2- F-11
<b>JD46523-2F</b>	<b>MW-608D_B_20220609</b>					
Arsenic <sup>a</sup>		207000	1000		ug/l	SW846 6010D
Iron <sup>a</sup>		52400	300		ug/l	SW846 6010D
<b>JD46523-3</b>	<b>MW-609D_A_20220609</b>					
Sulfate		1740	16		mg/l	EPA 300/SW846 9056A
Sulfide		5.3	2.0		mg/l	SM4500S2- F-11
<b>JD46523-3F</b>	<b>MW-609D_A_20220609</b>					
Arsenic <sup>a</sup>		649000	2500		ug/l	SW846 6010D
Iron <sup>a</sup>		90000	300		ug/l	SW846 6010D
<b>JD46523-4</b>	<b>MW-609D_B_20220609</b>					
Sulfate		1720	16		mg/l	EPA 300/SW846 9056A
Sulfide		5.9	2.0		mg/l	SM4500S2- F-11
<b>JD46523-4F</b>	<b>MW-609D_B_20220609</b>					
Arsenic <sup>a</sup>		638000	2500		ug/l	SW846 6010D
Iron <sup>a</sup>		83200	300		ug/l	SW846 6010D

(a) Analysis performed at SGS Orlando, FL.



## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_A_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-1	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1730	16	mg/l	8	06/16/22 14:52	JD	EPA 300/SW846 9056A
Sulfide	2.4	2.0	mg/l	1	06/13/22 14:10	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_A_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-1F	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	82200	500	ug/l	50	06/16/22	06/20/22	AFL	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron <sup>a</sup>	47800	300	ug/l	1	06/16/22	06/17/22	AFL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: F:MA18756  
(2) Instrument QC Batch: F:MA18761  
(3) Prep QC Batch: F:MP40862
- (a) Analysis performed at SGS Orlando, FL.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_B_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-2	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1800	16	mg/l	8	06/16/22 15:05	JD	EPA 300/SW846 9056A
Sulfide	4.3	2.0	mg/l	1	06/13/22 14:10	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_B_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-2F	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	207000	1000	ug/l	100	06/16/22	06/20/22	AFL	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron <sup>a</sup>	52400	300	ug/l	1	06/16/22	06/17/22	AFL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: F:MA18756  
(2) Instrument QC Batch: F:MA18761  
(3) Prep QC Batch: F:MP40862
- (a) Analysis performed at SGS Orlando, FL.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_A_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-3	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1740	16	mg/l	8	06/16/22 15:18	JD	EPA 300/SW846 9056A
Sulfide	5.3	2.0	mg/l	1	06/13/22 14:10	MP	SM4500S2- F-11

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_A_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-3F	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	649000	2500	ug/l	250	06/16/22	06/20/22	AFL	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron <sup>a</sup>	90000	300	ug/l	1	06/16/22	06/17/22	AFL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: F:MA18756  
(2) Instrument QC Batch: F:MA18761  
(3) Prep QC Batch: F:MP40862
- (a) Analysis performed at SGS Orlando, FL.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_B_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-4	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfate	1720	16	mg/l	8	06/16/22 15:31	JD	EPA 300/SW846 9056A
Sulfide	5.9	2.0	mg/l	1	06/13/22 14:10	MP	SM4500S2- F-11

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_B_20220609	<b>Date Sampled:</b>	06/09/22
<b>Lab Sample ID:</b>	JD46523-4F	<b>Date Received:</b>	06/09/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic <sup>a</sup>	638000	2500	ug/l	250	06/16/22	06/20/22	AFL	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron <sup>a</sup>	83200	300	ug/l	1	06/16/22	06/17/22	AFL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: F:MA18756  
(2) Instrument QC Batch: F:MA18761  
(3) Prep QC Batch: F:MP40862
- (a) Analysis performed at SGS Orlando, FL.

RL = Reporting Limit

## Misc. Forms


### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

SW-06122-130  
 JD 46523



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL. 732-329-0200 FAX 732-329-3499

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Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>	
Street Address 1015 Virginia Dr, Suite 100		Street 100 Green Street	
City Fort Washington, PA, 19034	State PA	City Marcus Hook, PA 19061	State PA
Project Contact Shana Whitney I: email swhitney@sanbornhead.com		Project # 4862.04	
Phone # 603-415-6159		Client Purchase Order #	
FAX #		City Concord, NH, 03301	
State		Zip	
Project Manager Chelsey Shepsko		Accounts Payable Chelsey Shepsko (cshepsko@sanbornhead.com)	

FED-EX Tracking #		Boiler Order Control #	
SGS Quote # 2022 644		SGS Job #	

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	Number of preserved bottles										LAB USE ONLY	
								Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	MW-6080-A-20220609		06/09/22	08:00	CS	GW	4	2	1	1	1	1	1	1	1	1	1	X	X
2	MW-6080-B-20220609		↓	08:15	↓	↓	4	2	1	1	1	1	1	1	1	1	1	X	X
3	MW-6090-A-20220609		↓	08:30	↓	↓	4	2	1	1	1	1	1	1	1	1	1	X	X
4	MW-6090-B-20220609		↓	08:45	↓	↓	4	2	1	1	1	1	1	1	1	1	1	X	X

Turnaround Time (Business Days)		Approved by (SGS Project Manager) Date:		Data Deliverable Information		Comments / Special Instructions	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink		Commercial "A" (Level 1) Commercial "B" (Level 2) X FULLT1 (Level 3+4) NJ Reduced X EDD Format SHA & Stantec EQuIS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		NYASP Category A NYASP Category B State Forms			

Sample Custody must be documented below each time samples change possession, including courier delivery.							
Relinquished by Sampler	Date Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date Time
1. Shana Whitney	06/09/22 15:00	1. [Signature]	16:26	2. [Signature]	06/09/22	2. [Signature]	
Relinquished by Sampler	Date Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date Time
3. [Signature]		3. [Signature]		4. [Signature]		4. [Signature]	
Relinquished by:	Date Time	Received By	Date Time	Custody Seal #	<input type="checkbox"/> Intact <input type="checkbox"/> Not intact Preserved where applicable		
5. [Signature]		5. [Signature]			On Ice <input type="checkbox"/> On Dry <input type="checkbox"/> Cooler Temp. 2.9		

P:\4800s\4862.04\Analytical\2022-04 A01-7 Soil\2022-04\_SGS\_Soil\_COC.xlsx

 Initial Assessment: AS2A  
 Label Verification: \_\_\_\_\_

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Sanborn, Head &amp; Associates, Inc.

JD46523: Chain of Custody

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## SGS Sample Receipt Summary

**Job Number:** JD46523

**Client:** SOVEREIGN CONSULTING

**Project:** SCNJCH:1280 ROUTE 27,COLONIA,NEW

**Date / Time Received:** 6/9/2022 4:26:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.9);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.6);

**Cooler Security**
**Y or N**
**Y or N**

- |  |  |
|--|--|
| 1. Custody Seals Present: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |  |
|---|--|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Cooler temp verification: <u>IR Gun</u>  |  |
| 3. Cooler media: <u>Ice (Bag)</u>   |  |
| 4. No. Coolers: <u>1</u>  |  |

**Quality Control Preservation**
**Y or N**
**N/A**

- |   |  |
|---|--|
| 1. Trip Blank present / cooler: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 2. Trip Blank listed on COC: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>    |  |
| 3. Samples preserved properly: <input checked="" type="checkbox"/> <input type="checkbox"/>                           |  |
| 4. VOCs headspace free: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>         |  |

**Sample Integrity - Documentation**
**Y or N**

- |   |  |
|---|--|
| 1. Sample labels present on bottles: <input checked="" type="checkbox"/> <input type="checkbox"/>   |  |
| 2. Container labeling complete: <input checked="" type="checkbox"/> <input type="checkbox"/>        |  |
| 3. Sample container label / COC agree: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |

**Sample Integrity - Condition**
**Y or N**

- |   |  |
|---|--|
| 1. Sample recvd within HT: <input checked="" type="checkbox"/> <input type="checkbox"/>       |  |
| 2. All containers accounted for: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 3. Condition of sample: <u>Intact</u>   |  |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |  |  |
|--|--|
| 1. Analysis requested is clear: <input checked="" type="checkbox"/> <input type="checkbox"/>                             |  |
| 2. Bottles received for unspecified tests: <input type="checkbox"/> <input checked="" type="checkbox"/>                  |  |
| 3. Sufficient volume recvd for analysis: <input checked="" type="checkbox"/> <input type="checkbox"/>                    |  |
| 4. Compositing instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 5. Filtering instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>   |  |

Test Strip Lot #s:	pH 1-12: <u>231619</u>	pH 12+: <u>203117A</u>	Other: (Specify) _____
--------------------	------------------------	------------------------	------------------------

Comments

 SM089-03  
Rev. Date 12/7/17

JD46523: Chain of Custody

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## General Chemistry

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### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46523  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP40683/GN30302	2.0	0.0	mg/l	80	77.9	97.4	90-110%
Fluoride	GP40683/GN30302	0.20	0.0	mg/l	2	2.00	100.0	90-110%
Sulfate	GP40683/GN30302	2.0	0.0	mg/l	80	78.5	98.1	90-110%
Sulfide	GN30204			mg/l	5	5.0	100.0	80-120%
Sulfide	GN30204			mg/l	10	9.8	98.0	80-120%
Sulfide	GN30204	2.0	0.0	mg/l	5	5.0	100.0	80-120%
Sulfide	GN30204			mg/l	10	9.9	99.0	80-120%

Associated Samples:  
Batch GN30204: JD46523-1, JD46523-2, JD46523-3, JD46523-4  
Batch GP40683: JD46523-1, JD46523-2, JD46523-3, JD46523-4  
(\*) Outside of QC limits

5.1  
5

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46523  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP40683/GN30302	JD46365-10	mg/l	95.7	94.9	0.8	0-20%
Fluoride	GP40683/GN30302	JD46365-10	mg/l	0.12	0.12	0.0	0-20%
Sulfate	GP40683/GN30302	JD46365-10	mg/l	7.8	7.8	0.0	0-20%
Sulfide	GN30204	JD46523-2	mg/l	4.3	4.4	2.3	0-12%

Associated Samples:

Batch GN30204: JD46523-1, JD46523-2, JD46523-3, JD46523-4

Batch GP40683: JD46523-1, JD46523-2, JD46523-3, JD46523-4

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD46523  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP40683/GN30302	JD46365-10	mg/l	95.7	80	171	94.1	80-120%
Fluoride	GP40683/GN30302	JD46365-10	mg/l	0.12	2	2.1	99.0	80-120%
Sulfate	GP40683/GN30302	JD46365-10	mg/l	7.8	80	87.4	99.5	80-120%
Sulfide	GN30204	JD46523-1	mg/l	2.4	3.57	5.5	86.8	37-135%

Associated Samples:

Batch GN30204: JD46523-1, JD46523-2, JD46523-3, JD46523-4

Batch GP40683: JD46523-1, JD46523-2, JD46523-3, JD46523-4

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



## Misc. Forms

### Custody Documents and Other Forms

(SGS Orlando, FL)

---

Includes the following where applicable:

- Chain of Custody

## CHAIN OF CUSTODY

**SGS North America Inc. - Dayton**  
2235 Route 130, Dayton, NJ 08810  
TEL. 732-329-0200 FAX: 732-329-3499/3480

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[illegible]

jd46523.xls  
Rev. Date: 4/19/18

## JD46523: Chain of Custody

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## SGS Orlando, FL

SGS

22 of 29

JD46523

## SGS Sample Receipt Summary

Job Number: JD46523

Client: SGS NJ

Project: SANHPAFW

Date / Time Received: 6/15/2022 9:30:00 AM

Delivery Method: FEDEX

Airbill #s: 5272 0642 3690

Therm ID: IR 1;

Therm CF: 0.4;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.2);

Cooler Temps (Corrected) °C: Cooler 1: (2.6);

### Cooler Information

Y or N

- |                             |                                     |                          |
|-----------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present    | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification | <u>IR Gun</u>                       |                          |
| 5. Cooler media             | <u>Ice (Bag)</u>                    |                          |

### Trip Blank Information

Y or N

N/A

- |                                |                          |                          |                                     |
|--------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC    | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                | <u>W or S</u>            |                          | <u>N/A</u>                          |
| 3. Type Of TB Received         | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Information

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Samples preserved properly                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Condition of sample                              | <u>Intact</u>                       |                                     |                                     |
| 5. Sample recvd within HT                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 6. Dates/Times/IDs on COC match Sample Label        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 7. VOCs have headspace                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 9. Compositing instructions clear                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs?         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received?                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present?                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Misc. Information

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_

Number of 5035 Field Kits: \_\_\_\_\_

Number of Lab Filtered Metals: \_\_\_\_\_

Test Strip Lot #s: pH 0-3 \_\_\_\_\_ 230315 \_\_\_\_\_

pH 10-12 \_\_\_\_\_ 219813A \_\_\_\_\_

Other: (Specify) \_\_\_\_\_

Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: SAMUELM

Date: 6/15/2022 9:30:00 AM

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

JD46523: Chain of Custody

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## Metals Analysis

### QC Data Summaries

(SGS Orlando, FL)

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD46523  
Account: ALNJ - SGS Dayton, NJ  
Project: SUNOCOSS: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP40862  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/16/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	14	14		
Antimony	6.0	1	1		
Arsenic	10	1.3	1.3	-1.1	<10
Barium	200	.5	1		
Beryllium	4.0	.1	.2		
Cadmium	5.0	.1	.2		
Calcium	1000	50	50		
Chromium	10	.5	1		
Cobalt	50	.2	.2		
Copper	25	1	1		
Iron	300	15	17	3.0	<300
Lead	5.0	1	1.1		
Magnesium	5000	35	35		
Manganese	15	.25	1		
Molybdenum	50	.3	.3		
Nickel	40	.4	.4		
Potassium	10000	100	200		
Selenium	10	2	2.9		
Silver	10	.5	.7		
Sodium	10000	250	500		
Strontium	10	.25	.5		
Thallium	10	1	1.4		
Tin	50	.5	1		
Titanium	10	.5	1		
Vanadium	50	.5	.6		
Zinc	20	3	4.4		

Associated samples MP40862: JD46523-1F, JD46523-2F, JD46523-3F, JD46523-4F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46523  
 Account: ALNJ - SGS Dayton, NJ  
 Project: SUNOCOSS: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP40862  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

06/16/22

06/16/22

Metal	JD46358-1F Original DUP		RPD	QC Limits	JD46358-1F Original MS		Spikelot MPFLICP2	% Rec	QC Limits
Aluminum	anr								
Antimony									
Arsenic	0.0	0.0	NC	0-20	0.0	1920	2000	96.0	80-120
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper	anr								
Iron	83.8	79.6	5.1	0-20	83.8	24300	26000	93.1	80-120
Lead	anr								
Magnesium									
Manganese									
Molybdenum									
Nickel									
Potassium									
Selenium									
Silver									
Sodium	anr								
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc	anr								

Associated samples MP40862: JD46523-1F, JD46523-2F, JD46523-3F, JD46523-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD46523  
 Account: ALNJ - SGS Dayton, NJ  
 Project: SUNOCOSS: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP40862  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/16/22

	JD46358-1F		Spikelot		MSD	QC
Metal	Original	MSD	MPFLICP2	% Rec	RPD	Limit
Aluminum	anr					20
Antimony						
Arsenic	0.0	1940	2000	97.0		
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper	anr					
Iron	83.8	24500	26000	93.9	0.8	20
Lead	anr					
Magnesium						
Manganese						
Molybdenum						
Nickel						
Potassium						
Selenium						
Silver						
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	anr					

Associated samples MP40862: JD46523-1F, JD46523-2F, JD46523-3F, JD46523-4F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD46523

Account: ALNJ - SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP40862

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 06/16/22

Metal	BSP Result	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic	1940	2000	97.0	80-120
Barium				
Beryllium				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron	24900	26000	95.8	80-120
Lead	anr			
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP40862: JD46523-1F, JD46523-2F, JD46523-3F, JD46523-4F

Results &lt; IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested



# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD46523  
 Account: ALNJ - SGS Dayton, NJ  
 Project: SUNOCOSS: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP40862  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/16/22

Metal	JD46358-1F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony				
Arsenic	0.00	0.00	NC	0-10
Barium				
Beryllium				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron	83.8	0.00	100.0(a)	0-10
Lead	anr			
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP40862: JD46523-1F, JD46523-2F, JD46523-3F, JD46523-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD47557

Sampling Date: 06/28/22



Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 25



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47557

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47557-1F	06/28/22	11:05	CSS	06/29/22	AQ Groundwater Filtered	MW-560D_20220628_A
JD47557-2F	06/28/22	11:15	CSS	06/29/22	AQ Groundwater Filtered	MW-560D_20220628_B
JD47557-3F	06/28/22	11:25	CSS	06/29/22	AQ Groundwater Filtered	MW-560D_20220628_C
JD47557-4F	06/28/22	13:00	CSS	06/29/22	AQ Groundwater Filtered	MW-606S_20220628_A
JD47557-5F	06/28/22	13:10	CSS	06/29/22	AQ Groundwater Filtered	MW-606S_20220628_B
JD47557-6F	06/28/22	13:20	CSS	06/29/22	AQ Groundwater Filtered	MW-606S_20220628_C

## Summary of Hits

Page 1 of 1

**Job Number:** JD47557  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/28/22

2

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47557-1F</b>	<b>MW-560D_20220628_A</b>					
Arsenic		26100	15		ug/l	SW846 6010D
<b>JD47557-2F</b>	<b>MW-560D_20220628_B</b>					
Arsenic		20700	15		ug/l	SW846 6010D
<b>JD47557-3F</b>	<b>MW-560D_20220628_C</b>					
Arsenic		15700	15		ug/l	SW846 6010D
<b>JD47557-4F</b>	<b>MW-606S_20220628_A</b>					
Arsenic		6810	3.0		ug/l	SW846 6010D
<b>JD47557-5F</b>	<b>MW-606S_20220628_B</b>					
Arsenic		6550	3.0		ug/l	SW846 6010D
<b>JD47557-6F</b>	<b>MW-606S_20220628_C</b>					
Arsenic		6210	3.0		ug/l	SW846 6010D

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220628_A	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-1F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	26100	15	ug/l	5	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220628_B	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-2F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	20700	15	ug/l	5	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220628_C	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-3F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15700	15	ug/l	5	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220628_A	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-4F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6810	3.0	ug/l	1	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220628_B	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-5F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6550	3.0	ug/l	1	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220628_C	<b>Date Sampled:</b>	06/28/22
<b>Lab Sample ID:</b>	JD47557-6F	<b>Date Received:</b>	06/29/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6210	3.0	ug/l	1	07/02/22	07/05/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52680  
(2) Prep QC Batch: MP33856

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



SGIS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL. 732-329-0200 FAX 732-329-3499

VP-062122-120

Please merge with SDG:

UD47557

[illegible]

3.

## JD47557: Chain of Custody

Page 1 of 2



## SGS Sample Receipt Summary

**Job Number:** JD47557

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 6/29/2022 5:20:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.8);

**Cooler Security**
**Y or N**
**Y or N**

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

**Quality Control Preservation**
**Y or N**
**N/A**

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**
**Y or N**

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Sample Integrity - Condition**
**Y or N**

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Test Strip Lot #s:**

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

 SM089-03  
Rev. Date 12/7/17

JD47557: Chain of Custody

Page 2 of 2

## Metals Analysis

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### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47557  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/02/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	9.2	150		
Antimony	6.0	2.8	4.7		
Arsenic	3.0	2.6	2.8	-1.2	<3.0
Barium	200	.2	13		
Beryllium	1.0	.2	.5		
Bismuth	20	2.5	8.6		
Boron	100	1.8	10		
Cadmium	3.0	.4	1		
Calcium	5000	13	99		
Cerium	100				
Chromium	10	.7	2		
Cobalt	50	.6	2.6		
Copper	10	.7	5.9		
Iron	100	3.3	32		
Lead	3.0	2	1.8		
Lithium	50	1.5	7.3		
Magnesium	5000	25	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.8	1.7		
Phosphorus	50	7	18		
Potassium	10000	35	200		
Selenium	10	3.6	4.9		
Silicon	200	2.2	32		
Silver	10	.6	6.1		
Sodium	10000	14	570		
Strontium	10	.1	2.7		
Sulfur	50	3.7	45		
Thallium	10	5.2	1.8		
Tin	10	1.4	3.7		
Titanium	10	.8	2.5		
Tungsten	50	1.3	40		
Vanadium	50	.5	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47557  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/02/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.3	6.9		
Zirconium	10	.5	4.1		

Associated samples MP33856: JD47557-1F, JD47557-2F, JD47557-3F, JD47557-4F, JD47557-5F, JD47557-6F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	JD47557-1F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	26100	27200	2000	55.0 (a) 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	JD47557-1F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zirconium

Associated samples MP33856: JD47557-1F, JD47557-2F, JD47557-3F, JD47557-4F, JD47557-5F, JD47557-6F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	JD47557-1F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	26100	28900	2000	140.0(a)	6.1
Barium	anr				20
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	JD47557-1F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zirconium

Associated samples MP33856: JD47557-1F, JD47557-2F, JD47557-3F, JD47557-4F, JD47557-5F, JD47557-6F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47557

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

07/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1780	2000	89.0	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP33856: JD47557-1F, JD47557-2F, JD47557-3F, JD47557-4F, JD47557-5F, JD47557-6F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

JD47557-1F		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum	anr		
Antimony	anr		
Arsenic	26100 25200	3.6	0-10
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47557  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33856  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/02/22

Metal	JD47557-1F	QC	
	Original SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP33856: JD47557-1F, JD47557-2F, JD47557-3F, JD47557-4F, JD47557-5F, JD47557-6F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

5.1.4

5

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD47740

Sampling Date: 06/23/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 59



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink, appearing to read "D. Chastain".

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47740

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47740-1F	06/23/22	09:20 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_1A
JD47740-2F	06/23/22	09:30 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_1B
JD47740-3F	06/23/22	09:40 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_2A
JD47740-4F	06/23/22	09:50 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_2B
JD47740-5F	06/23/22	10:00 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_3A
JD47740-6F	06/23/22	10:10 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CS_3B
JD47740-7F	06/23/22	11:20 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_FB_4A
JD47740-8F	06/23/22	11:30 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_FB_4B
JD47740-9F	06/23/22	11:40 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_FB_7A
JD47740-10F	06/23/22	11:50 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_FB_7B
JD47740-11F	06/23/22	08:20 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_8A
JD47740-12F	06/23/22	08:30 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_8B
JD47740-13F	06/23/22	08:40 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_10A



## Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD47740

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47740-14F	06/23/22	08:50 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_10B
JD47740-15F	06/23/22	09:00 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_12A
JD47740-16F	06/23/22	09:10 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_HL_12B
JD47740-17F	06/23/22	10:20 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_1A
JD47740-18F	06/23/22	10:30 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_1B
JD47740-19F	06/23/22	10:40 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_2A
JD47740-20F	06/23/22	10:50 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_2B
JD47740-21F	06/23/22	11:00 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_3A
JD47740-22F	06/23/22	11:10 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_IX_3B
JD47740-23F	06/23/22	08:00 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CONTROL1A
JD47740-24F	06/23/22	08:10 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CONTROL1B
JD47740-25F	06/23/22	12:00 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CONTROL2A
JD47740-26F	06/23/22	12:10 ML	07/01/22	AQ	Groundwater Filtered	MW-56D_CONTROL2B

## Summary of Hits

Page 1 of 3

**Job Number:** JD47740  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/23/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47740-1F</b>	<b>MW-56D_CS_1A</b>					
Arsenic		6660	3.0		ug/l	SW846 6010D
<b>JD47740-2F</b>	<b>MW-56D_CS_1B</b>					
Arsenic		4370	3.0		ug/l	SW846 6010D
<b>JD47740-3F</b>	<b>MW-56D_CS_2A</b>					
Arsenic		7350	3.0		ug/l	SW846 6010D
<b>JD47740-4F</b>	<b>MW-56D_CS_2B</b>					
Arsenic		5330	3.0		ug/l	SW846 6010D
<b>JD47740-5F</b>	<b>MW-56D_CS_3A</b>					
Arsenic		9050	6.0		ug/l	SW846 6010D
<b>JD47740-6F</b>	<b>MW-56D_CS_3B</b>					
Arsenic		8320	6.0		ug/l	SW846 6010D
<b>JD47740-7F</b>	<b>MW-56D_FB_4A</b>					
Arsenic		3930	3.0		ug/l	SW846 6010D
<b>JD47740-8F</b>	<b>MW-56D_FB_4B</b>					
Arsenic		3370	3.0		ug/l	SW846 6010D
<b>JD47740-9F</b>	<b>MW-56D_FB_7A</b>					
Arsenic		2320	3.0		ug/l	SW846 6010D
<b>JD47740-10F</b>	<b>MW-56D_FB_7B</b>					
Arsenic		2780	3.0		ug/l	SW846 6010D
<b>JD47740-11F</b>	<b>MW-56D_HL_8A</b>					
Arsenic		4540	3.0		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD47740  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/23/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47740-12F</b>	<b>MW-56D_HL_8B</b>					
Arsenic		2910	3.0		ug/l	SW846 6010D
<b>JD47740-13F</b>	<b>MW-56D_HL_10A</b>					
Arsenic		2150	3.0		ug/l	SW846 6010D
<b>JD47740-14F</b>	<b>MW-56D_HL_10B</b>					
Arsenic		1920	15		ug/l	SW846 6010D
<b>JD47740-15F</b>	<b>MW-56D_HL_12A</b>					
Arsenic		353	3.0		ug/l	SW846 6010D
<b>JD47740-16F</b>	<b>MW-56D_HL_12B</b>					
Arsenic		158	3.0		ug/l	SW846 6010D
<b>JD47740-17F</b>	<b>MW-56D_IX_1A</b>					
Arsenic		2670	3.0		ug/l	SW846 6010D
<b>JD47740-18F</b>	<b>MW-56D_IX_1B</b>					
Arsenic		3230	3.0		ug/l	SW846 6010D
<b>JD47740-19F</b>	<b>MW-56D_IX_2A</b>					
Arsenic		2230	3.0		ug/l	SW846 6010D
<b>JD47740-20F</b>	<b>MW-56D_IX_2B</b>					
Arsenic		2000	3.0		ug/l	SW846 6010D
<b>JD47740-21F</b>	<b>MW-56D_IX_3A</b>					
Arsenic		1770	15		ug/l	SW846 6010D
<b>JD47740-22F</b>	<b>MW-56D_IX_3B</b>					
Arsenic		1810	3.0		ug/l	SW846 6010D



## Summary of Hits

**Job Number:** JD47740  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 06/23/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47740-23F</b>	<b>MW-56D_CONTROL1A</b>					
Arsenic		5650	3.0		ug/l	SW846 6010D
<b>JD47740-24F</b>	<b>MW-56D_CONTROL1B</b>					
Arsenic		3650	3.0		ug/l	SW846 6010D
<b>JD47740-25F</b>	<b>MW-56D_CONTROL2A</b>					
Arsenic		6680	3.0		ug/l	SW846 6010D
<b>JD47740-26F</b>	<b>MW-56D_CONTROL2B</b>					
Arsenic		5070	3.0		ug/l	SW846 6010D

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_1A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-1F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6660	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_1B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-2F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4370	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_2A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-3F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7350	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_2B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-4F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5330	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_3A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-5F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9050	6.0	ug/l	2	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CS_3B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-6F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8320	6.0	ug/l	2	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-56D_FB_4A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-7F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3930	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_FB_4B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-8F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3370	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_FB_7A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-9F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2320	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_FB_7B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-10F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2780	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_8A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-11F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4540	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_8B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-12F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2910	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_10A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-13F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2150	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_10B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-14F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1920	15	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_12A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-15F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	353	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_HL_12B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-16F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	158	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_1A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-17F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2670	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_1B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-18F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3230	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_2A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-19F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2230	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_2B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-20F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2000	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33918

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_3A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-21F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1770	15	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_IX_3B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-22F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1810	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CONTROL1A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-23F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5650	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CONTROL1B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-24F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3650	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CONTROL2A	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-25F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6680	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_CONTROL2B	<b>Date Sampled:</b>	06/23/22
<b>Lab Sample ID:</b>	JD47740-26F	<b>Date Received:</b>	07/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5070	3.0	ug/l	1	07/07/22	07/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52702  
(2) Prep QC Batch: MP33807

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

GW

JD 47740

SGS		CHAIN OF CUSTODY		Page 1 of 2	
SGS North America Inc. - Dayton 2235 Route 130, Dayton, NJ 08810 TEL. 732-329-0200 FAX 732-329-3499		Please merge with SDG:		Bottle Order Control #	
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook		Matrix Codes	
Street Address 1155 Business Center Drive, Suite 210 City Horsham, PA, 19044		Billing Information (if different from Report to) Company Name Sanborn Head & Associates Street Address 20 Foundry Street		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment OI - Oil LQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank EB- Equipment Blank RB- Rinse Blank TB- Trip Blank	
Project Contact Shana Whitney E-mail swhitney@sanbornhead.com		Project # 4882.04		City Concord, NH, 03301	
Phone # 803-415-8156		Client Purchase Order #		State Zip	
Sampler(s) Name(s) Michael Lee		Project Manager Chelsey Shepato		Accounts Payable: ap@sanbornhead.com	
Field ID / Point of Collection		Collection		Number of preserved bottles	
Lab Sample #	MECHDOI Val #	Date	Time	Sampled by	Matrix
1F	MW-56D CS 1A	6/23/2022	9:20	ML	GW
2F	MW-56D CS 1B	6/23/2022	9:30	ML	GW
3F	MW-56D CS 2A	6/23/2022	9:40	ML	GW
4F	MW-56D CS 2B	6/23/2022	9:50	ML	GW
5F	MW-56D CS 3A	6/23/2022	10:00	ML	GW
6F	MW-56D CS 3B	6/23/2022	10:10	ML	GW
7F	MW-56D FB 4A	6/23/2022	11:20	ML	GW
8F	MW-56D FB 4B	6/23/2022	11:30	ML	GW
9F	MW-56D FB 7A	6/23/2022	11:400	ML	GW
10F	MW-56D FB 7B	6/23/2022	11:50	ML	GW
11F	MW-56D HL 8A	6/23/2022	8:20	ML	GW
12F	MW-56D HL 8B	6/23/2022	8:30	ML	GW
13F	MW-56D HL 10A	6/23/2022	8:40	ML	GW
14F	MW-56D HL 10B	6/23/2022	8:50	ML	GW
15F	MW-56D HL 12A	6/23/2022	9:00	ML	GW
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:		Date Deliverable Information	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other Emergency & Rush TIA data available via LabLink		Commercial "A" (Level 1) Commercial "B" (Level 2) NJ Reduced x REDT1 Commercial "C" NJ Data of Known Quality Protocol/Reporting Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		NYASBP Category A NYASBP Category B State Forms x EDD Format SHA EQ48; Statelac EQ48 Other	
Comments / Special Instructions A = S15 G48; B = S40 G35		Sample Custody must be documented below each time samples change possession, including courier delivery.			
Prepared by Michael Lee	Date/Time 7-1-22	Received By [Signature]	Date/Time 7-1-22	Received By [Signature]	Date/Time 7-1-22
Requisitioned by S	Date/Time	Received By S	Date/Time	Received By S	Date/Time
Requisitioned by S	Date/Time	Received By S	Date/Time	Received By S	Date/Time
Intact Not Preserved where applicable		On Ice On Ice Cooler Temp.			

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Page 1 of 1

3.0 c.p.



## SGS Sample Receipt Summary

Job Number: JD47740

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN MARCUS HOOK

Date / Time Received: 7/1/2022 5:30:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.7);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD47740: Chain of Custody

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## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33807  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-0.70	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33807  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP33807: JD47740-21F, JD47740-22F, JD47740-23F, JD47740-24F, JD47740-25F, JD47740-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.1.2



Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47740  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33807  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-21F Original MS	Spikelet MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP33807: JD47740-21F, JD47740-22F, JD47740-23F, JD47740-24F, JD47740-25F, JD47740-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

## 5.1.2



Methods: SW846 6010D  
Units: ug/l

07/07/22

Page 3

## 5.1.2



Methods: SW846 6010D  
Units: ug/l

07/07/22



22F, JD477  
purposes

Zirconium

Associated samples MP33807: JD47740-21F, JD47740-22F, JD47740-23F, JD47740-24F, JD47740-25F, JD47740-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

## 5.1.3

Prep Date: 07/07/22

Page 1



## 5.1.3

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Methods: SW846 6010D  
Units: ug/l

07/07/22

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SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47740  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33807  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-21F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	355	359	1.3	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33807  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-21F Original SDL 1:5	%DIF	QC Limits
-------	---------------------------------	------	--------------

Zinc

Zirconium

Associated samples MP33807: JD47740-21F, JD47740-22F, JD47740-23F, JD47740-24F, JD47740-25F, JD47740-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-1.4	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP33918: JD47740-1F, JD47740-2F, JD47740-3F, JD47740-4F, JD47740-5F, JD47740-6F, JD47740-7F, JD47740-8F, JD47740-9F, JD47740-10F, JD47740-11F, JD47740-12F, JD47740-13F, JD47740-14F, JD47740-15F, JD47740-16F, JD47740-17F, JD47740-18F, JD47740-19F, JD47740-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.2.2



Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47740  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-14F Original MS	Spikelet MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP33918: JD47740-1F, JD47740-2F, JD47740-3F, JD47740-4F, JD47740-5F, JD47740-6F, JD47740-7F, JD47740-8F, JD47740-9F, JD47740-10F, JD47740-11F, JD47740-12F, JD47740-13F, JD47740-14F, JD47740-15F, JD47740-16F, JD47740-17F, JD47740-18F, JD47740-19F, JD47740-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## 5.2.2



Methods: SW846 6010D  
Units: ug/l

07/07/22

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47740  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-14F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc

Zirconium

Associated samples MP33918: JD47740-1F, JD47740-2F, JD47740-3F, JD47740-4F, JD47740-5F, JD47740-6F, JD47740-7F, JD47740-8F, JD47740-9F, JD47740-10F, JD47740-11F, JD47740-12F, JD47740-13F, JD47740-14F, JD47740-15F, JD47740-16F, JD47740-17F, JD47740-18F, JD47740-19F, JD47740-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## 5.2.3

Prep Date: 07/07/22



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47740  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/07/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP33918: JD47740-1F, JD47740-2F, JD47740-3F, JD47740-4F, JD47740-5F, JD47740-6F, JD47740-7F, JD47740-8F, JD47740-9F, JD47740-10F, JD47740-11F, JD47740-12F, JD47740-13F, JD47740-14F, JD47740-15F, JD47740-16F, JD47740-17F, JD47740-18F, JD47740-19F, JD47740-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

JD47740-14F		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum			
Antimony			
Arsenic	384	395	2.8 0-10
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47740  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33918  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/07/22

Metal	JD47740-14F Original SDL 1:5	%DIF	QC Limits
-------	---------------------------------	------	--------------

Zinc

Zirconium

Associated samples MP33918: JD47740-1F, JD47740-2F, JD47740-3F, JD47740-4F, JD47740-5F, JD47740-6F, JD47740-7F, JD47740-8F, JD47740-9F, JD47740-10F, JD47740-11F, JD47740-12F, JD47740-13F, JD47740-14F, JD47740-15F, JD47740-16F, JD47740-17F, JD47740-18F, JD47740-19F, JD47740-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD47981

Sampling Date: 07/05/22



Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com  
  
ATTN: Chelsey Shepsko

Total number of pages in report: 59



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47981

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47981-1F	07/05/22	09:20 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_1A
JD47981-2F	07/05/22	09:30 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_1B
JD47981-3F	07/05/22	09:40 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_2A
JD47981-4F	07/05/22	09:50 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_2B
JD47981-5F	07/05/22	10:00 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_3A
JD47981-6F	07/05/22	10:10 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CS_3B
JD47981-7F	07/05/22	11:20 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_FB_4A
JD47981-8F	07/05/22	11:30 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_FB_4B
JD47981-9F	07/05/22	11:40 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_FB_7A
JD47981-10F	07/05/22	11:50 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_FB_7B
JD47981-11F	07/05/22	08:20 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_8A
JD47981-12F	07/05/22	08:30 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_8B
JD47981-13F	07/05/22	08:40 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_10A





Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD47981

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47981-14F	07/05/22	08:50 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_10B
JD47981-15F	07/05/22	09:00 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_12A
JD47981-16F	07/05/22	09:10 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_HL_12B
JD47981-17F	07/05/22	10:20 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_1A
JD47981-18F	07/05/22	10:30 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_1B
JD47981-19F	07/05/22	10:40 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_2A
JD47981-20F	07/05/22	10:50 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_2B
JD47981-21F	07/05/22	11:00 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_3A
JD47981-22F	07/05/22	11:10 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_IX_3B
JD47981-23F	07/05/22	08:00 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CONTROL1A
JD47981-24F	07/05/22	08:10 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CONTROL1B
JD47981-25F	07/05/22	12:00 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CONTROL2A
JD47981-26F	07/05/22	12:10 ML	07/08/22	AQ	Groundwater Filtered	MW-609D_CONTROL2B

## Summary of Hits

Page 1 of 3

**Job Number:** JD47981  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/05/22

2

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47981-1F</b>	<b>MW-609D_CS_1A</b>					
Arsenic		16700	12		ug/l	SW846 6010D
<b>JD47981-2F</b>	<b>MW-609D_CS_1B</b>					
Arsenic		15500	12		ug/l	SW846 6010D
<b>JD47981-3F</b>	<b>MW-609D_CS_2A</b>					
Arsenic		21800	30		ug/l	SW846 6010D
<b>JD47981-4F</b>	<b>MW-609D_CS_2B</b>					
Arsenic		24400	30		ug/l	SW846 6010D
<b>JD47981-5F</b>	<b>MW-609D_CS_3A</b>					
Arsenic		31400	30		ug/l	SW846 6010D
<b>JD47981-6F</b>	<b>MW-609D_CS_3B</b>					
Arsenic		29300	15		ug/l	SW846 6010D
<b>JD47981-7F</b>	<b>MW-609D_FB_4A</b>					
Arsenic		13800	30		ug/l	SW846 6010D
<b>JD47981-8F</b>	<b>MW-609D_FB_4B</b>					
Arsenic		13100	12		ug/l	SW846 6010D
<b>JD47981-9F</b>	<b>MW-609D_FB_7A</b>					
Arsenic		14400	6.0		ug/l	SW846 6010D
<b>JD47981-10F</b>	<b>MW-609D_FB_7B</b>					
Arsenic		13800	6.0		ug/l	SW846 6010D
<b>JD47981-11F</b>	<b>MW-609D_HL_8A</b>					
Arsenic		15100	6.0		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD47981  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/05/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47981-12F</b>	<b>MW-609D_HL_8B</b>					
Arsenic		14600	6.0		ug/l	SW846 6010D
<b>JD47981-13F</b>	<b>MW-609D_HL_10A</b>					
Arsenic		14000	6.0		ug/l	SW846 6010D
<b>JD47981-14F</b>	<b>MW-609D_HL_10B</b>					
Arsenic		10800	6.0		ug/l	SW846 6010D
<b>JD47981-15F</b>	<b>MW-609D_HL_12A</b>					
Arsenic		8170	6.0		ug/l	SW846 6010D
<b>JD47981-16F</b>	<b>MW-609D_HL_12B</b>					
Arsenic <sup>a</sup>		5720	6.0		ug/l	SW846 6010D
<b>JD47981-17F</b>	<b>MW-609D_IX_1A</b>					
Arsenic <sup>a</sup>		3410	6.0		ug/l	SW846 6010D
<b>JD47981-18F</b>	<b>MW-609D_IX_1B</b>					
Arsenic <sup>a</sup>		6030	6.0		ug/l	SW846 6010D
<b>JD47981-19F</b>	<b>MW-609D_IX_2A</b>					
Arsenic <sup>a</sup>		3730	6.0		ug/l	SW846 6010D
<b>JD47981-20F</b>	<b>MW-609D_IX_2B</b>					
Arsenic <sup>a</sup>		773	6.0		ug/l	SW846 6010D
<b>JD47981-21F</b>	<b>MW-609D_IX_3A</b>					
Arsenic		33.3	3.0		ug/l	SW846 6010D
<b>JD47981-22F</b>	<b>MW-609D_IX_3B</b>					
Arsenic		1300	3.0		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD47981  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/05/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47981-23F    MW-609D_CONTROL1A</b>						
Arsenic		15400	15		ug/l	SW846 6010D
<b>JD47981-24F    MW-609D_CONTROL1B</b>						
Arsenic		12200	15		ug/l	SW846 6010D
<b>JD47981-25F    MW-609D_CONTROL2A</b>						
Arsenic		15500	15		ug/l	SW846 6010D
<b>JD47981-26F    MW-609D_CONTROL2B</b>						
Arsenic		12100	15		ug/l	SW846 6010D

(a) Elevated sample detection limit due to limited volume.

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_1A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-1F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	16700	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_1B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-2F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15500	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_2A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-3F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	21800	30	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_2B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-4F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	24400	30	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_3A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-5F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	31400	30	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CS_3B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-6F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	29300	15	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_FB_4A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-7F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13800	30	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_FB_4B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-8F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13100	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_FB_7A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-9F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14400	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_FB_7B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-10F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13800	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_8A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-11F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15100	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_8B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-12F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14600	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_10A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-13F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14000	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_10B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-14F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10800	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_12A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-15F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8170	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_HL_12B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-16F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	5720	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_1A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-17F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	3410	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_1B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-18F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	6030	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_2A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-19F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	3730	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_2B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-20F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	773	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34207  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_3A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-21F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	33.3	3.0	ug/l	1	07/22/22	07/22/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52763  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_IX_3B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-22F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1300	3.0	ug/l	1	07/22/22	07/22/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52763  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CONTROL1A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-23F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15400	15	ug/l	5	07/22/22	07/25/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52765  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CONTROL1B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-24F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12200	15	ug/l	5	07/22/22	07/25/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52765  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CONTROL2A	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-25F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15500	15	ug/l	5	07/22/22	07/25/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52765  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_CONTROL2B	<b>Date Sampled:</b>	07/05/22
<b>Lab Sample ID:</b>	JD47981-26F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12100	15	ug/l	5	07/22/22	07/25/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52765  
(2) Prep QC Batch: MP34206

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



GW

None

JD47981

Page of

Please merge with SDG: Felix: 5272-0642-8135

SGS		CHAIN OF CUSTODY		SGS North America Inc. - Dayton 2235 Route 130, Dayton, NJ 08810 TEL. 732-329-0200 FAX 732-329-3499		FED-EX Tracking #		Bottle Order Control #	
Client / Reporting Information		Project Information		Requested Analysis (see TABS CODE sheet)		Matrix Codes			
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook							
Street Address 1155 Business Center Drive, Suite 210		Street 100 Green Street		Billing Information (if different from Report to)					
City Horsham, PA, 19044		City Marcus Hook, PA 19061		Company Name Sanborn Head & Associates					
Project Contact Shane Whitney		Project # 4862.04		Street Address 20 Foundry Street					
Phone # 603-415-6159		Client Purchase Order #		City Concord, NH, 03301					
Sampler(s) Name(s) Michael Lee		Project Manager Chelsey Shepsko		Altitude Chelsey Shepsko (cshpsko@sanbornhead.com)					
Field ID / Point of Collection		Collection		Number of preserved bottles					
Lab Sample #	Field ID / Point of Collection	MEQ/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	PC	NO3
1E	MW-609D CS 1A		7/5/2022	9:20	ML	GW	1		
2E	MW-609D CS 1B		7/5/2022	9:30	ML	GW	1		
3E	MW-609D CS 2A		7/5/2022	9:40	ML	GW	1		
4E	MW-609D CS 2B		7/5/2022	9:50	ML	GW	1		
5E	MW-609D CS 3A		7/5/2022	10:00	ML	GW	1		
6E	MW-609D CS 3B		7/5/2022	10:10	ML	GW	1		
7E	MW-609D FB 4A		7/5/2022	11:20	ML	GW	1		
8E	MW-609D FB 4B		7/5/2022	11:30	ML	GW	1		
9E	MW-609D FB 7A		7/5/2022	11:40	ML	GW	1		
10E	MW-609D FB 7B		7/5/2022	11:50	ML	GW	1		
11E	MW-609D HL 8A		7/5/2022	8:20	ML	GW	1		
12E	MW-609D HL 8B		7/5/2022	8:30	ML	GW	1		
13E	MW-609D HL 10A		7/5/2022	8:40	ML	GW	1		
14E	MW-609D HL 10B		7/5/2022	8:50	ML	GW	1		
15E	MW-609D HL 12A		7/5/2022	9:00	ML	GW	1		
Turnaround Time (Business days)		Approved by (SGS Project Manager) Date:		Data Deliverable Information		Comments / Special Instructions			
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink		Approved by (SGS Project Manager) Date: _____ _____ _____ _____		Commercial "A" (Level 1) Commercial "B" (Level 2) FULLT1 (Level 3+4) NJ Reduced x REDT1 x EDD Format SHA EQUIS; Stantec EQUIS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		NYASP Category A NYASP Category B State Forms			
Prepared by: Michael Lee Date Time: 7-7-22 09:15 Received by: [Signature] Date Time: 7-7-22 10:12 Rechecked by: [Signature] Date Time: 7-7-22 10:12		Sample Custody must be documented below each time samples change possession, including courier delivery. Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12		Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12		Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12		Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12 Received by: [Signature] Date Time: 7-7-22 10:12	

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Initial Assignment

Label Verification

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1691

2.0 2-1P  
2.4 2-1P

Sanborn Head &amp; Associates, Inc.

JD47981: Chain of Custody

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SGS

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JD47981



## SGS Sample Receipt Summary

Job Number: JD47981

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN MARCUS HOOK

Date / Time Received: 7/8/2022 10:00:00 AM

Delivery Method: Fed Ex

Airbill #s: 5272 0642 8935

Cooler Temps (Raw Measured) °C: Cooler 1: (2.0); Cooler 2: (2.4);

Cooler Temps (Corrected) °C: Cooler 1: (1.7); Cooler 2: (2.1);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 2                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD47981: Chain of Custody

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## Metals Analysis

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### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47981  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/22/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.0	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47981  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/22/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP34206: JD47981-21F, JD47981-22F, JD47981-23F, JD47981-24F, JD47981-25F, JD47981-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	JD47981-21F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	33.3	2040	2000	100.3
Barium	anr			75-125
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	JD47981-21F Original MS	Spikelet MPSPK2	% Rec	QC Limits
-------	----------------------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP34206: JD47981-21F, JD47981-22F, JD47981-23F, JD47981-24F, JD47981-25F, JD47981-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	JD47981-21F Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	33.3	2040	2000	100.3	0.0	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	JD47981-21F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	-----------------------------	--------------------	-------	------------	-------------

Zinc anr

Zirconium

Associated samples MP34206: JD47981-21F, JD47981-22F, JD47981-23F, JD47981-24F, JD47981-25F, JD47981-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47981

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

07/22/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1990	2000	99.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP34206: JD47981-21F, JD47981-22F, JD47981-23F, JD47981-24F, JD47981-25F, JD47981-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

JD47981-21F		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum	anr		
Antimony	anr		
Arsenic	33.3 35.4	6.3	0-10
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34206  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/22/22

Metal	JD47981-21F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc anr

Zirconium

Associated samples MP34206: JD47981-21F, JD47981-22F, JD47981-23F, JD47981-24F, JD47981-25F, JD47981-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47981  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-0.50	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47981  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP34207: JD47981-1F, JD47981-2F, JD47981-3F, JD47981-4F, JD47981-5F, JD47981-6F, JD47981-7F, JD47981-8F, JD47981-9F, JD47981-10F, JD47981-11F, JD47981-12F, JD47981-13F, JD47981-14F, JD47981-15F, JD47981-16F, JD47981-17F, JD47981-18F, JD47981-19F, JD47981-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



## 5.2.2



Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47981-6F Original MS	Spikelet MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP34207: JD47981-1F, JD47981-2F, JD47981-3F, JD47981-4F, JD47981-5F, JD47981-6F, JD47981-7F, JD47981-8F, JD47981-9F, JD47981-10F, JD47981-11F, JD47981-12F, JD47981-13F, JD47981-14F, JD47981-15F, JD47981-16F, JD47981-17F, JD47981-18F, JD47981-19F, JD47981-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

## 5.2.2



Methods: SW846 6010D  
Units: ug/l

07/26/22

Page 3

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47981-6F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc

Zirconium

Associated samples MP34207: JD47981-1F, JD47981-2F, JD47981-3F, JD47981-4F, JD47981-5F, JD47981-6F, JD47981-7F, JD47981-8F, JD47981-9F, JD47981-10F, JD47981-11F, JD47981-12F, JD47981-13F, JD47981-14F, JD47981-15F, JD47981-16F, JD47981-17F, JD47981-18F, JD47981-19F, JD47981-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

## 5.2.3

Prep Date: 07/26/22



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP34207: JD47981-1F, JD47981-2F, JD47981-3F, JD47981-4F, JD47981-5F, JD47981-6F, JD47981-7F, JD47981-8F, JD47981-9F, JD47981-10F, JD47981-11F, JD47981-12F, JD47981-13F, JD47981-14F, JD47981-15F, JD47981-16F, JD47981-17F, JD47981-18F, JD47981-19F, JD47981-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47981-6F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	5850	5880	0.5	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47981  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34207  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47981-6F Original SDL 1:5	%DIF	QC Limits
-------	--------------------------------	------	--------------

Zinc

Zirconium

Associated samples MP34207: JD47981-1F, JD47981-2F, JD47981-3F, JD47981-4F, JD47981-5F, JD47981-6F, JD47981-7F, JD47981-8F, JD47981-9F, JD47981-10F, JD47981-11F, JD47981-12F, JD47981-13F, JD47981-14F, JD47981-15F, JD47981-16F, JD47981-17F, JD47981-18F, JD47981-19F, JD47981-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD47982

Sampling Date: 07/06/22



Report to:

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Total number of pages in report: 59



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47982

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47982-1F	07/06/22	09:20 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_1A
JD47982-2F	07/06/22	09:30 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_1B
JD47982-3F	07/06/22	09:40 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_2A
JD47982-4F	07/06/22	09:50 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_2B
JD47982-5F	07/06/22	10:00 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_3A
JD47982-6F	07/06/22	10:10 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CS_3B
JD47982-7F	07/06/22	11:20 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_FB_4A
JD47982-8F	07/06/22	11:30 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_FB_4B
JD47982-9F	07/06/22	11:40 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_FB_7A
JD47982-10F	07/06/22	11:50 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_FB_7B
JD47982-11F	07/06/22	08:20 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_8A
JD47982-12F	07/06/22	08:30 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_8B
JD47982-13F	07/06/22	08:40 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_10A



## Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD47982

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47982-14F	07/06/22	08:50 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_10B
JD47982-15F	07/06/22	09:00 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_12A
JD47982-16F	07/06/22	09:10 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_HL_12B
JD47982-17F	07/06/22	10:20 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_1A
JD47982-18F	07/06/22	10:30 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_1B
JD47982-19F	07/06/22	10:40 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_2A
JD47982-20F	07/06/22	10:50 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_2B
JD47982-21F	07/06/22	11:00 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_3A
JD47982-22F	07/06/22	11:10 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_IX_3B
JD47982-23F	07/06/22	08:00 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CONTROL1A
JD47982-24F	07/06/22	08:10 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CONTROL1B
JD47982-25F	07/06/22	12:00 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CONTROL2A
JD47982-26F	07/06/22	12:10 ML	07/08/22	AQ	Groundwater Filtered	MW-608D_CONTROL2B

## Summary of Hits

Page 1 of 3

**Job Number:** JD47982  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47982-1F</b>	<b>MW-608D_CS_1A</b>					
Arsenic		22900	12		ug/l	SW846 6010D
<b>JD47982-2F</b>	<b>MW-608D_CS_1B</b>					
Arsenic		21500	12		ug/l	SW846 6010D
<b>JD47982-3F</b>	<b>MW-608D_CS_2A</b>					
Arsenic		31500	12		ug/l	SW846 6010D
<b>JD47982-4F</b>	<b>MW-608D_CS_2B</b>					
Arsenic		27100	12		ug/l	SW846 6010D
<b>JD47982-5F</b>	<b>MW-608D_CS_3A</b>					
Arsenic		33100	30		ug/l	SW846 6010D
<b>JD47982-6F</b>	<b>MW-608D_CS_3B</b>					
Arsenic		71200	30		ug/l	SW846 6010D
<b>JD47982-7F</b>	<b>MW-608D_FB_4A</b>					
Arsenic		15500	12		ug/l	SW846 6010D
<b>JD47982-8F</b>	<b>MW-608D_FB_4B</b>					
Arsenic		19500	12		ug/l	SW846 6010D
<b>JD47982-9F</b>	<b>MW-608D_FB_7A</b>					
Arsenic		17000	12		ug/l	SW846 6010D
<b>JD47982-10F</b>	<b>MW-608D_FB_7B</b>					
Arsenic		15800	12		ug/l	SW846 6010D
<b>JD47982-11F</b>	<b>MW-608D_HL_8A</b>					
Arsenic		21900	12		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD47982  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47982-12F</b>	<b>MW-608D_HL_8B</b>					
Arsenic		22400	12		ug/l	SW846 6010D
<b>JD47982-13F</b>	<b>MW-608D_HL_10A</b>					
Arsenic		19400	12		ug/l	SW846 6010D
<b>JD47982-14F</b>	<b>MW-608D_HL_10B</b>					
Arsenic		14400	12		ug/l	SW846 6010D
<b>JD47982-15F</b>	<b>MW-608D_HL_12A</b>					
Arsenic		15800	12		ug/l	SW846 6010D
<b>JD47982-16F</b>	<b>MW-608D_HL_12B</b>					
Arsenic <sup>a</sup>		5610	6.0		ug/l	SW846 6010D
<b>JD47982-17F</b>	<b>MW-608D_IX_1A</b>					
Arsenic		10300	6.0		ug/l	SW846 6010D
<b>JD47982-18F</b>	<b>MW-608D_IX_1B</b>					
Arsenic		16400	12		ug/l	SW846 6010D
<b>JD47982-19F</b>	<b>MW-608D_IX_2A</b>					
Arsenic <sup>a</sup>		2950	6.0		ug/l	SW846 6010D
<b>JD47982-20F</b>	<b>MW-608D_IX_2B</b>					
Arsenic <sup>a</sup>		3980	6.0		ug/l	SW846 6010D
<b>JD47982-21F</b>	<b>MW-608D_IX_3A</b>					
Arsenic		945	3.0		ug/l	SW846 6010D
<b>JD47982-22F</b>	<b>MW-608D_IX_3B</b>					
Arsenic		6160	3.0		ug/l	SW846 6010D

## Summary of Hits

Page 3 of 3

**Job Number:** JD47982  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 07/06/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD47982-23F    MW-608D_CONTROL1A</b>						
Arsenic		23300	15		ug/l	SW846 6010D
<b>JD47982-24F    MW-608D_CONTROL1B</b>						
Arsenic		22700	15		ug/l	SW846 6010D
<b>JD47982-25F    MW-608D_CONTROL2A</b>						
Arsenic		18300	15		ug/l	SW846 6010D
<b>JD47982-26F    MW-608D_CONTROL2B</b>						
Arsenic		27300	15		ug/l	SW846 6010D

(a) Elevated sample detection limit due to limited volume.

## Sample Results

## Report of Analysis



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_1A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-1F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	22900	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_1B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-2F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	21500	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_2A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-3F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	31500	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_2B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-4F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	27100	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_3A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-5F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	33100	30	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CS_3B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-6F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	71200	30	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_FB_4A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-7F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15500	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_FB_4B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-8F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	19500	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_FB_7A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-9F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	17000	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_FB_7B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-10F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15800	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_8A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-11F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	21900	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_8B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-12F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	22400	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_10A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-13F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	19400	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_10B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-14F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14400	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_12A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-15F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	15800	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_HL_12B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-16F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	5610	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_1A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-17F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10300	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_1B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-18F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	16400	12	ug/l	2	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_2A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-19F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	2950	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_2B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-20F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	3980	6.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34208  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_3A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-21F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	945	3.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_IX_3B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-22F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6160	3.0	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CONTROL1A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-23F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	23300	15	ug/l	1	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CONTROL1B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-24F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	22700	15	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CONTROL2A	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-25F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	18300	15	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_CONTROL2B	<b>Date Sampled:</b>	07/06/22
<b>Lab Sample ID:</b>	JD47982-26F	<b>Date Received:</b>	07/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	27300	15	ug/l	5	07/26/22	07/27/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52777  
(2) Prep QC Batch: MP34209

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

GW

12/11

JD47982

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Please merge with SDG: *Fedex 7272-0642-89 13*

SGS		CHAIN OF CUSTODY		SGS North America Inc. - Dayton		2235 Route 130, Dayton, NJ 08810		TEL 732-329-0200 FAX 732-329-3499	
Client Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes			
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook		Billing Information (if different from Report to)					
Street Address 1155 Business Center Drive, Suite 210		Street 100 Green Street							
City State Zip Horsham, PA, 19044		City State Marcus Hook, PA 19061		Company Name Sanborn Head & Associates					
Project Contact Shana Whitney switney@sanbornhead.com		Project # 4862.04		Street Address 20 Foundry Street					
Phone # 603-415-6159		Client Purchase Order #		City State Zip Concord, NH, 03301					
Sampler(s) Name(s) Michael Lee		Project Manager Chelsey Shepsko		Altitude Chelsey Shepsko (shepsko@sanbornhead.com)		Accounts Payable api@sanbornhead.com			
Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date Time	Sampled by	Matrix	# of bottles	Number of preserved bottles	LAB USE ONLY	
1F	MW-608D CS 1A		7/6/2022 9:20	ML	GW	1	1	X	
2F	MW-608D CS 1B		7/6/2022 9:30	ML	GW	1	1	X	
3F	MW-608D CS 2A		7/6/2022 9:40	ML	GW	1	1	X	
4F	MW-608D CS 2B		7/6/2022 9:50	ML	GW	1	1	X	
5F	MW-608D CS 3A		7/6/2022 10:00	ML	GW	1	1	X	
6F	MW-608D CS 3B		7/6/2022 10:10	ML	GW	1	1	X	
7F	MW-608D FB 4A		7/6/2022 11:20	ML	GW	1	1	X	
8F	MW-608D FB 4B		7/6/2022 11:30	ML	GW	1	1	X	
9F	MW-608D FB 7A		7/6/2022 11:40	ML	GW	1	1	X	
10F	MW-608D FB 7B		7/6/2022 11:50	ML	GW	1	1	X	
11F	MW-608D HL 8A		7/6/2022 8:20	ML	GW	1	1	X	
12F	MW-608D HL 8B		7/6/2022 8:30	ML	GW	1	1	X	
13F	MW-608D HL 10A		7/6/2022 8:40	ML	GW	1	1	X	
14F	MW-608D HL 10B		7/6/2022 8:50	ML	GW	1	1	X	
15F	MW-608D HL 12A		7/6/2022 9:00	ML	GW	1	1	X	
Turnaround Time (Business days)		Data Deliverable Information		Comments / Special Instructions					
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush T/A data available via LabLink		Approved by (SGS Project Manager) Date: _____ Commercial "A" (Level 1) NYASB Category A Commercial "B" (Level 2) NYASB Category B FULLT1 (Level 344) State Forms NJ Reduced x REDT1 x EDD Formal SHA EQUS; Statist EQUS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Comments / Special Instructions					
Reinspected by: <i>Michael Lee</i> Date Time: <i>7-7-22 9:41</i> Reinspected by Sample: <i>FCRPH</i> Date Time: <i>7/7/22</i>		Sample Custody must be maintained below each time samples change possession, including courier delivery. Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i> Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i> Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i> Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Received By: <i>Fedex</i> Date Time: <i>7-7-22 18:15</i> Received By: <i>Fedex</i> Date Time: <i>7-7-22 18:15</i>	
Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Reinspected by: <i>FCRPH</i> Date Time: <i>7-7-22 10:00 pm</i>		Received By: <i>Fedex</i> Date Time: <i>7-7-22 18:15</i>	

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Initial Assessment *NA(26)*  
Label Verification

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2.0 C-UP  
Sanborn Head & Associates, Inc.  
24 C-IP

JD47982: Chain of Custody

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SGS

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JD47982



## SGS Sample Receipt Summary

**Job Number:** JD47982

**Client:** SANBORN HEAD & ASSOCIATES

**Project:** EVERGREEN MARCUS HOOK

**Date / Time Received:** 7/8/2022 10:00:00 AM

**Delivery Method:** FedEx

**Airbill #s:** 5272 0642 8913

**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.0); Cooler 2: (2.4);

**Cooler Temps (Corrected) °C:** Cooler 1: (1.7); Cooler 2: (2.1);

**Cooler Security**
**Y or N**
**Y or N**

- |  |  |
|--|--|
| 1. Custody Seals Present: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |  |
|---|--|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Cooler temp verification: <u>IR Gun</u>  |  |
| 3. Cooler media: <u>Ice (Bag)</u>   |  |
| 4. No. Coolers: <u>2</u>  |  |

**Quality Control Preservation**
**Y or N**
**N/A**

- |   |  |
|---|--|
| 1. Trip Blank present / cooler: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 2. Trip Blank listed on COC: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>    |  |
| 3. Samples preserved properly: <input checked="" type="checkbox"/> <input type="checkbox"/>                           |  |
| 4. VOCs headspace free: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>         |  |

**Sample Integrity - Documentation**
**Y or N**

- |   |  |
|---|--|
| 1. Sample labels present on bottles: <input checked="" type="checkbox"/> <input type="checkbox"/>   |  |
| 2. Container labeling complete: <input checked="" type="checkbox"/> <input type="checkbox"/>        |  |
| 3. Sample container label / COC agree: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |

**Sample Integrity - Condition**
**Y or N**

- |   |  |
|---|--|
| 1. Sample recvd within HT: <input checked="" type="checkbox"/> <input type="checkbox"/>       |  |
| 2. All containers accounted for: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 3. Condition of sample: <u>Intact</u>   |  |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |  |  |
|--|--|
| 1. Analysis requested is clear: <input checked="" type="checkbox"/> <input type="checkbox"/>                             |  |
| 2. Bottles received for unspecified tests: <input type="checkbox"/> <input checked="" type="checkbox"/>                  |  |
| 3. Sufficient volume recvd for analysis: <input checked="" type="checkbox"/> <input type="checkbox"/>                    |  |
| 4. Compositing instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |  |
| 5. Filtering instructions clear: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>   |  |

Test Strip Lot #s:	pH 1-12: <u>231619</u>	pH 12+: <u>203117A</u>	Other: (Specify) _____
--------------------	------------------------	------------------------	------------------------

Comments

SM089-03  
Rev. Date 12/7/17

JD47982: Chain of Custody

Page 3 of 3

## Metals Analysis

5

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47982  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.20	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47982  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP34208: JD47982-1F, JD47982-2F, JD47982-3F, JD47982-4F, JD47982-5F, JD47982-6F, JD47982-7F, JD47982-8F, JD47982-9F, JD47982-10F, JD47982-11F, JD47982-12F, JD47982-13F, JD47982-14F, JD47982-15F, JD47982-16F, JD47982-17F, JD47982-18F, JD47982-19F, JD47982-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.1.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-6F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP34208: JD47982-1F, JD47982-2F, JD47982-3F, JD47982-4F, JD47982-5F, JD47982-6F, JD47982-7F, JD47982-8F, JD47982-9F, JD47982-10F, JD47982-11F, JD47982-12F, JD47982-13F, JD47982-14F, JD47982-15F, JD47982-16F, JD47982-17F, JD47982-18F, JD47982-19F, JD47982-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-6F Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	71200	41300	10000	-299.0(a)	23.7 (b)	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-6F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc

Zirconium

Associated samples MP34208: JD47982-1F, JD47982-2F, JD47982-3F, JD47982-4F, JD47982-5F, JD47982-6F, JD47982-7F, JD47982-8F, JD47982-9F, JD47982-10F, JD47982-11F, JD47982-12F, JD47982-13F, JD47982-14F, JD47982-15F, JD47982-16F, JD47982-17F, JD47982-18F, JD47982-19F, JD47982-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) High rpd due to possible sample nonhomogeneity.

## 5.1.3

Prep Date: 07/26/22

Page 1

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP34208: JD47982-1F, JD47982-2F, JD47982-3F, JD47982-4F, JD47982-5F, JD47982-6F, JD47982-7F, JD47982-8F, JD47982-9F, JD47982-10F, JD47982-11F, JD47982-12F, JD47982-13F, JD47982-14F, JD47982-15F, JD47982-16F, JD47982-17F, JD47982-18F, JD47982-19F, JD47982-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-6F			QC	
	Original	SDL 2:10	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	14200	14500	1.5	0-10	
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					



# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34208  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-6F Original SDL 2:10 %DIF	QC Limits
-------	--------------------------------------	--------------

Zinc

Zirconium

Associated samples MP34208: JD47982-1F, JD47982-2F, JD47982-3F, JD47982-4F, JD47982-5F, JD47982-6F, JD47982-7F, JD47982-8F, JD47982-9F, JD47982-10F, JD47982-11F, JD47982-12F, JD47982-13F, JD47982-14F, JD47982-15F, JD47982-16F, JD47982-17F, JD47982-18F, JD47982-19F, JD47982-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47982  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-0.80	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD47982  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 07/26/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP34209: JD47982-21F, JD47982-22F, JD47982-23F, JD47982-24F, JD47982-25F, JD47982-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-23F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	23300	33000	10000	97.0
Barium				75-125
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-23F Original MS	Spikelet MPSPK2	% Rec	QC Limits
-------	----------------------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP34209: JD47982-21F, JD47982-22F, JD47982-23F, JD47982-24F, JD47982-25F, JD47982-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-23F Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	23300	31400	10000	81.0	5.0	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	JD47982-23F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	-----------------------------	--------------------	-------	------------	-------------

Zinc anr

Zirconium

Associated samples MP34209: JD47982-21F, JD47982-22F, JD47982-23F, JD47982-24F, JD47982-25F, JD47982-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47982

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

07/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1840	2000	92.0	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc anr

Zirconium

Associated samples MP34209: JD47982-21F, JD47982-22F, JD47982-23F, JD47982-24F, JD47982-25F, JD47982-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

JD47982-23F		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum			
Antimony			
Arsenic	4660 4690	0.7	0-10
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium	anr		
Calcium			
Cerium			
Chromium			
Cobalt			
Copper	anr		
Iron			
Lead	anr		
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD47982  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34209  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 07/26/22

	JD47982-23F		QC
Metal	Original SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP34209: JD47982-21F, JD47982-22F, JD47982-23F, JD47982-24F, JD47982-25F, JD47982-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD49604

Sampling Date: 08/04/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 59



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink, appearing to read "D. Chastain".

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD49604

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD49604-1F	08/04/22	09:20 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_8A
JD49604-2F	08/04/22	09:30 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_8B
JD49604-3F	08/04/22	09:40 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_10A
JD49604-4F	08/04/22	09:50 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_10B
JD49604-5F	08/04/22	10:00 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_12A
JD49604-6F	08/04/22	10:10 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_NAOH_12B
JD49604-7F	08/04/22	11:20 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_FB_4A
JD49604-8F	08/04/22	11:30 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_FB_4B
JD49604-9F	08/04/22	11:40 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_FB_7A
JD49604-10F	08/04/22	11:50 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_FB_7B
JD49604-11F	08/04/22	08:20 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_8A
JD49604-12F	08/04/22	08:30 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_8B
JD49604-13F	08/04/22	08:40 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_10A



Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD49604

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD49604-14F	08/04/22	08:50 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_10B
JD49604-15F	08/04/22	09:00 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_12A
JD49604-16F	08/04/22	09:10 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_HL_12B
JD49604-17F	08/04/22	10:20 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_1A
JD49604-18F	08/04/22	10:30 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_1B
JD49604-19F	08/04/22	10:40 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_2A
JD49604-20F	08/04/22	10:50 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_2B
JD49604-21F	08/04/22	11:00 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_3A
JD49604-22F	08/04/22	11:10 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_IX_3B
JD49604-23F	08/04/22	08:00 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_CONTROL1A
JD49604-24F	08/04/22	08:10 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_CONTROL1B
JD49604-25F	08/04/22	12:00 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_CONTROL2A
JD49604-26F	08/04/22	12:10 ML	08/06/22	AQ	Groundwater Filtered	MW-606S_CONTROL2B

## Summary of Hits

**Job Number:** JD49604  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 08/04/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**JD49604-1F**      **MW-606S\_NAOH\_8A**

No hits reported in this sample.

**JD49604-2F**      **MW-606S\_NAOH\_8B**

Arsenic	7.9	3.0		ug/l	SW846 6010D
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**JD49604-3F**      **MW-606S\_NAOH\_10A**

Arsenic	13.6	3.0		ug/l	SW846 6010D
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**JD49604-4F**      **MW-606S\_NAOH\_10B**

Arsenic	13.1	3.0		ug/l	SW846 6010D
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**JD49604-5F**      **MW-606S\_NAOH\_12A**

Arsenic	43.3	3.0		ug/l	SW846 6010D
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**JD49604-6F**      **MW-606S\_NAOH\_12B**

Arsenic	119	3.0		ug/l	SW846 6010D
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**JD49604-7F**      **MW-606S\_FB\_4A**

No hits reported in this sample.

**JD49604-8F**      **MW-606S\_FB\_4B**

No hits reported in this sample.

**JD49604-9F**      **MW-606S\_FB\_7A**

No hits reported in this sample.

**JD49604-10F**      **MW-606S\_FB\_7B**

No hits reported in this sample.

**JD49604-11F**      **MW-606S\_HL\_8A**

Arsenic	6.4	3.0		ug/l	SW846 6010D
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## Summary of Hits

**Job Number:** JD49604  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 08/04/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD49604-12F MW-606S\_HL\_8B

Arsenic	5.5	3.0		ug/l	SW846 6010D
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### JD49604-13F MW-606S\_HL\_10A

Arsenic	5.5	3.0		ug/l	SW846 6010D
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### JD49604-14F MW-606S\_HL\_10B

No hits reported in this sample.

### JD49604-15F MW-606S\_HL\_12A

Arsenic	7.4	3.0		ug/l	SW846 6010D
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### JD49604-16F MW-606S\_HL\_12B

Arsenic	4.8	3.0		ug/l	SW846 6010D
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### JD49604-17F MW-606S\_IX\_1A

No hits reported in this sample.

### JD49604-18F MW-606S\_IX\_1B

No hits reported in this sample.

### JD49604-19F MW-606S\_IX\_2A

No hits reported in this sample.

### JD49604-20F MW-606S\_IX\_2B

No hits reported in this sample.

### JD49604-21F MW-606S\_IX\_3A

No hits reported in this sample.

### JD49604-22F MW-606S\_IX\_3B

No hits reported in this sample.

Summary of Hits

Job Number: JD49604  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 08/04/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD49604-23F MW-606S\_CONTROL1A

Arsenic	9.4	3.0		ug/l	SW846 6010D
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JD49604-24F MW-606S\_CONTROL1B

Arsenic	26.0	3.0		ug/l	SW846 6010D
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JD49604-25F MW-606S\_CONTROL2A

No hits reported in this sample.

JD49604-26F MW-606S\_CONTROL2B

No hits reported in this sample.

## Sample Results

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## Report of Analysis

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Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_8A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-1F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	< 6.0	6.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539  
  
(a) Elevated sample detection limit due to limited volume.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_8B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-2F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.9	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_10A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-3F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13.6	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_10B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-4F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13.1	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_12A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-5F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	43.3	3.0	ug/l	1	08/11/22	08/17/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52874  
(2) Prep QC Batch: MP34539

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-606S_NAOH_12B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-6F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	119	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_FB_4A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-7F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_FB_4B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-8F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_FB_7A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-9F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_FB_7B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-10F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_8A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-11F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.4	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_8B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-12F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.5	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_10A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-13F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.5	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_10B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-14F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_12A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-15F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.4	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_HL_12B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-16F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4.8	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_1A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-17F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_1B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-18F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_2A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-19F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_2B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-20F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/11/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34539

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_3A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-21F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-606S_IX_3B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-22F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_CONTROL1A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-23F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.4	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_CONTROL1B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-24F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	26.0	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_CONTROL2A	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-25F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-606S_CONTROL2B	<b>Date Sampled:</b>	08/04/22
<b>Lab Sample ID:</b>	JD49604-26F	<b>Date Received:</b>	08/06/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody





## CHAIN OF CUSTODY

**SGS North America Inc. - Dayton**  
2235 Route 130, Dayton, NJ 08810  
TEL. 732-329-0200 FAX 732-329-3499

Page 2 of 2

Please merge with SDG:

FED-EX Tracking #
SGS Quote # 2022 644

Bottle Order Control #
SGS Job #

[illegible]



## SGS Sample Receipt Summary

Job Number: JD49604

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN MARCUS HOOK

Date / Time Received: 8/6/2022 10:06:00 AM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (4.2);

Cooler Temps (Corrected) °C: Cooler 1: (4.8);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD49604: Chain of Custody

Page 3 of 3

## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/11/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-0.50	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/11/22

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP34539: JD49604-1F, JD49604-2F, JD49604-3F, JD49604-4F, JD49604-5F, JD49604-6F, JD49604-7F, JD49604-8F, JD49604-9F, JD49604-10F, JD49604-11F, JD49604-12F, JD49604-13F, JD49604-14F, JD49604-15F, JD49604-16F, JD49604-17F, JD49604-18F, JD49604-19F, JD49604-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.1.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F Original MS	Spikelot MPSPK2	QC Limits
Aluminum			
Antimony			
Arsenic	0.0	3870	4000
Barium			
Beryllium			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			
Zinc			

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP34539: JD49604-1F, JD49604-2F, JD49604-3F, JD49604-4F, JD49604-5F, JD49604-6F, JD49604-7F, JD49604-8F, JD49604-9F, JD49604-10F, JD49604-11F, JD49604-12F, JD49604-13F, JD49604-14F, JD49604-15F, JD49604-16F, JD49604-17F, JD49604-18F, JD49604-19F, JD49604-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0	3960	4000	99.0	2.3	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP34539: JD49604-1F, JD49604-2F, JD49604-3F, JD49604-4F, JD49604-5F, JD49604-6F, JD49604-7F, JD49604-8F, JD49604-9F, JD49604-10F, JD49604-11F, JD49604-12F, JD49604-13F, JD49604-14F, JD49604-15F, JD49604-16F, JD49604-17F, JD49604-18F, JD49604-19F, JD49604-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested



### 5.1.3



## 5.1.3

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SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	0.00	0.00	NC	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34539  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/11/22

Metal	JD49604-1F Original SDL 1:5	%DIF	QC Limits
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Zinc

Zirconium

Associated samples MP34539: JD49604-1F, JD49604-2F, JD49604-3F, JD49604-4F, JD49604-5F, JD49604-6F, JD49604-7F, JD49604-8F, JD49604-9F, JD49604-10F, JD49604-11F, JD49604-12F, JD49604-13F, JD49604-14F, JD49604-15F, JD49604-16F, JD49604-17F, JD49604-18F, JD49604-19F, JD49604-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.10	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP34560: JD49604-21F, JD49604-22F, JD49604-23F, JD49604-24F, JD49604-25F, JD49604-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits	
Aluminum					
Antimony					
Arsenic	0.0	1950	2000	97.5	75-125
Barium					
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon	anr				
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc	anr				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original MS	Spikelet MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP34560: JD49604-21F, JD49604-22F, JD49604-23F, JD49604-24F, JD49604-25F, JD49604-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0	1950	2000	97.5	0.0	20
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon	anr					
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49604  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP34560: JD49604-21F, JD49604-22F, JD49604-23F, JD49604-24F, JD49604-25F, JD49604-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

### 5.2.3



Methods: SW846 6010D  
Units: ug/l

08/12/22



### 5.2.3



Methods: SW846 6010D  
Units: ug/l

08/12/22

Associated samples MP34560: JD49604-21F, JD49604-22F, JD49604-23F, JD49604-24F, JD49604-25F, JD49604-26F

SGS

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	0.00	0.00	NC	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon	anr			
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49604  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original SDL 1:5	%DIF	QC Limits
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Zinc anr

Zirconium

Associated samples MP34560: JD49604-21F, JD49604-22F, JD49604-23F, JD49604-24F, JD49604-25F, JD49604-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD49646

Sampling Date: 08/05/22



Report to:

Sanborn Head & Associates, Inc.  
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Fort Washington, PA 19034  
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ATTN: Chelsey Shepsko

Total number of pages in report: **59**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD49646

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD49646-1F	08/05/22	14:20 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_8A
JD49646-2F	08/05/22	14:30 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_8B
JD49646-3F	08/05/22	14:40 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_10A
JD49646-4F	08/05/22	14:50 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_10B
JD49646-5F	08/05/22	15:00 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_12A
JD49646-6F	08/05/22	15:10 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_NAOH_12B
JD49646-7F	08/05/22	16:20 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_FB_4A
JD49646-8F	08/05/22	16:30 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_FB_4B
JD49646-9F	08/05/22	16:40 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_FB_7A
JD49646-10F	08/05/22	16:50 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_FB_7B
JD49646-11F	08/05/22	13:20 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_8A
JD49646-12F	08/05/22	13:30 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_8B
JD49646-13F	08/05/22	13:40 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_10A



Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD49646

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD49646-14F	08/05/22	13:50 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_10B
JD49646-15F	08/05/22	14:00 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_12A
JD49646-16F	08/05/22	14:10 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_HL_12B
JD49646-17F	08/05/22	15:20 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_1A
JD49646-18F	08/05/22	15:30 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_1B
JD49646-19F	08/05/22	15:40 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_2A
JD49646-20F	08/05/22	15:50 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_2B
JD49646-21F	08/05/22	16:00 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_3A
JD49646-22F	08/05/22	16:10 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_IX_3B
JD49646-23F	08/05/22	13:00 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_CONTROL1A
JD49646-24F	08/05/22	13:10 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_CONTROL1B
JD49646-25F	08/05/22	17:00 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_CONTROL2A
JD49646-26F	08/05/22	17:10 ML	08/08/22	AQ	Groundwater Filtered	MW-560D_CONTROL2B

## Summary of Hits

Page 1 of 3

**Job Number:** JD49646  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 08/05/22

2

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD49646-1F</b>	<b>MW-560D_NAOH_8A</b>					
Arsenic		145	15		ug/l	SW846 6010D
<b>JD49646-2F</b>	<b>MW-560D_NAOH_8B</b>					
Arsenic		441	3.0		ug/l	SW846 6010D
<b>JD49646-3F</b>	<b>MW-560D_NAOH_10A</b>					
Arsenic		283	3.0		ug/l	SW846 6010D
<b>JD49646-4F</b>	<b>MW-560D_NAOH_10B</b>					
Arsenic		542	3.0		ug/l	SW846 6010D
<b>JD49646-5F</b>	<b>MW-560D_NAOH_12A</b>					
Arsenic		1370	3.0		ug/l	SW846 6010D
<b>JD49646-6F</b>	<b>MW-560D_NAOH_12B</b>					
Arsenic		2990	3.0		ug/l	SW846 6010D
<b>JD49646-7F</b>	<b>MW-560D_FB_4A</b>					
No hits reported in this sample.						
<b>JD49646-8F</b>	<b>MW-560D_FB_4B</b>					
Arsenic		8.4	3.0		ug/l	SW846 6010D
<b>JD49646-9F</b>	<b>MW-560D_FB_7A</b>					
Arsenic		3.6	3.0		ug/l	SW846 6010D
<b>JD49646-10F</b>	<b>MW-560D_FB_7B</b>					
Arsenic		5.4	3.0		ug/l	SW846 6010D
<b>JD49646-11F</b>	<b>MW-560D_HL_8A</b>					
Arsenic		85.5	3.0		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD49646  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 08/05/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD49646-12F</b>	<b>MW-560D_HL_8B</b>					
Arsenic		34.0	3.0		ug/l	SW846 6010D
<b>JD49646-13F</b>	<b>MW-560D_HL_10A</b>					
Arsenic		137	3.0		ug/l	SW846 6010D
<b>JD49646-14F</b>	<b>MW-560D_HL_10B</b>					
Arsenic		43.0	3.0		ug/l	SW846 6010D
<b>JD49646-15F</b>	<b>MW-560D_HL_12A</b>					
Arsenic		92.6	3.0		ug/l	SW846 6010D
<b>JD49646-16F</b>	<b>MW-560D_HL_12B</b>					
Arsenic		115	3.0		ug/l	SW846 6010D
<b>JD49646-17F</b>	<b>MW-560D_IX_1A</b>					
Arsenic		17.6	3.0		ug/l	SW846 6010D
<b>JD49646-18F</b>	<b>MW-560D_IX_1B</b>					
Arsenic		24.9	3.0		ug/l	SW846 6010D
<b>JD49646-19F</b>	<b>MW-560D_IX_2A</b>					
Arsenic		18.6	3.0		ug/l	SW846 6010D
<b>JD49646-20F</b>	<b>MW-560D_IX_2B</b>					
Arsenic		14.8	3.0		ug/l	SW846 6010D
<b>JD49646-21F</b>	<b>MW-560D_IX_3A</b>					
Arsenic		12.3	3.0		ug/l	SW846 6010D
<b>JD49646-22F</b>	<b>MW-560D_IX_3B</b>					
Arsenic		9.9	3.0		ug/l	SW846 6010D

Summary of Hits

Job Number: JD49646  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 08/05/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD49646-23F	MW-560D_CONTROL1A					
Arsenic		54.2	3.0		ug/l	SW846 6010D
JD49646-24F	MW-560D_CONTROL1B					
Arsenic		17.6	3.0		ug/l	SW846 6010D
JD49646-25F	MW-560D_CONTROL2A					
Arsenic		32.7	3.0		ug/l	SW846 6010D
JD49646-26F	MW-560D_CONTROL2B					
Arsenic		9.9	3.0		ug/l	SW846 6010D

## Sample Results

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## Report of Analysis

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Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_8A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-1F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	145	15	ug/l	1	08/12/22	08/17/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52874  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_8B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-2F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	441	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_10A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-3F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	283	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_10B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-4F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	542	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_12A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-5F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1370	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_NAOH_12B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-6F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2990	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_FB_4A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-7F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_FB_4B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-8F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8.4	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_FB_7A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-9F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.6	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_FB_7B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-10F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.4	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_8A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-11F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	85.5	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_8B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-12F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	34.0	3.0	ug/l	1	08/12/22	08/17/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52874  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_10A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-13F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	137	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_10B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-14F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	43.0	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_12A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-15F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	92.6	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_HL_12B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-16F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	115	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_1A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-17F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	17.6	3.0	ug/l	1	08/12/22	08/17/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52874  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_1B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-18F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	24.9	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_2A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-19F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	18.6	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_2B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-20F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14.8	3.0	ug/l	1	08/12/22	08/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52869  
(2) Prep QC Batch: MP34561

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_3A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-21F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12.3	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_IX_3B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-22F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.9	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_CONTROL1A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-23F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	54.2	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_CONTROL1B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-24F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	17.6	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_CONTROL2A	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-25F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	32.7	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_CONTROL2B	<b>Date Sampled:</b>	08/05/22
<b>Lab Sample ID:</b>	JD49646-26F	<b>Date Received:</b>	08/08/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.9	3.0	ug/l	1	08/12/22	08/15/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52861  
(2) Prep QC Batch: MP34560

RL = Reporting Limit



## Misc. Forms


### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

JD49646



**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL. 732-329-0200 FAX 732-329-3499

Page    of

Please merge with SDG:

PED-EX Tracking #  
 SGS Quote # 2022 844

Bottle Order Control #  
 SGS Job #

**Company Name**  
 Sanborn Head & Associates

**Project Name:**  
 Evergreen Marcus Hook

**Matrix Codes**  
 DW - Drinking Water  
 GW - Ground Water  
 WW - Water  
 SW - Surface Water  
 SO - Soil  
 SL - Sludge SED  
 Sediment Oil - Oil  
 LIQ - Other Liquid AIR  
 Air  
 SOL - Other Solid WP  
 Wipe  
 FB-Field Blank EB-  
 Equipment Blank  
 RB- Rinse Blank TB-  
 Trip Blank

**Street Address**  
 1155 Business Center Drive, Suite 210  
 City: Horsham, PA, 19044

**Street**  
 100 Green Street  
 City: Marcus Hook, PA 19061

**Billing Information (if different from Report to)**  
 Company Name: Sanborn Head & Associates  
 Street Address: 20 Foundry Street  
 City: Concord, NH, 03301

**Project Contact**  
 Shana Whitney  
 E-mail: shwhitney@sanbornhead.com  
 Phone #: 603-415-6159

**Project #**  
 4862.04

**Client Purchase Order #**  
 City: Concord, NH, 03301

**Sample(s) Name(s)**  
 Michael Lee

**Phone #**  
 302-798-9553

**Project Manager**  
 Chelsey Shepsko  
 E-mail: cshepsko@sanbornhead.com

**Lab Sample #**  
 16F, 17F, 18F, 19F, 20F, 21F, 22F, 23F, 24F, 25F, 26F

**Field ID / Point of Collection**  
 MW-560D\_HL\_12B, MW-560D\_IX\_1A, MW-560D\_IX\_1B, MW-560D\_IX\_2A, MW-560D\_IX\_2B, MW-560D\_IX\_3A, MW-560D\_IX\_3B, MW-560D\_Control1A, MW-560D\_Control1B, MW-560D\_Control2A, MW-560D\_Control2B

**Collection**  
 Date, Time, Sampled by, Matrix, # of bottles, etc.

**Turnaround Time (Business days)**  
☒ Std. 10 Business Days  
☐ 5 Day RUSH  
☐ 3 Day RUSH  
☐ 2 Day RUSH  
☐ 1 Day RUSH  
☐ other

**Approved by (SGS Project Manager)/Date:**  
 \_\_\_\_\_

**Date Deliverable Information**  
 Commercial "A" (Level 1)  
 Commercial "B" (Level 2)  
 FULLY1 (Level 3+4)  
 NJ Reduced  
 x REDT1  
 x EDO Format SHA EQU8; Statist EQU8

**Emergency & Rush T/A data available via LabLink**

**Comments / Special Instructions**

**Other**  
 Commercial "C"  
 NJ Data of Known Quality Protocol/Reporting  
 Commercial "A" = Results Only; Commercial "B" = Results + QC Summary  
 NJ Reduced = Results + QC Summary + Partial Raw data

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## SGS Sample Receipt Summary

Job Number: JD49646

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN MARCUS HOOK

Date / Time Received: 8/8/2022 5:00:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (4.2);

Cooler Temps (Corrected) °C: Cooler 1: (4.8);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD49646: Chain of Custody

Page 3 of 3

## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.10	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP34560: JD49646-21F, JD49646-22F, JD49646-23F, JD49646-24F, JD49646-25F, JD49646-26F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.1.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22





MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP34560: JD49646-21F, JD49646-22F, JD49646-23F, JD49646-24F, JD49646-25F, JD49646-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0	1950	2000	97.5	0.0	20
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon	anr					
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP34560: JD49646-21F, JD49646-22F, JD49646-23F, JD49646-24F, JD49646-25F, JD49646-26F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD49646

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

08/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1970	2000	98.5	80-120
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon	anr			
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	anr			
Zirconium				

## 5.1.3

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Methods: SW846 6010D  
Units: ug/l

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	0.00	0.00	NC	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon	anr			
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34560  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49633-2F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc anr

Zirconium

Associated samples MP34560: JD49646-21F, JD49646-22F, JD49646-23F, JD49646-24F, JD49646-25F, JD49646-26F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	-0.30	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	RL	IDL	MDL	MB raw	final
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Zinc 20 .1 6.9

Zirconium 10 .4 4.1

Associated samples MP34561: JD49646-1F, JD49646-2F, JD49646-3F, JD49646-4F, JD49646-5F, JD49646-6F, JD49646-7F, JD49646-8F, JD49646-9F, JD49646-10F, JD49646-11F, JD49646-12F, JD49646-13F, JD49646-14F, JD49646-15F, JD49646-16F, JD49646-17F, JD49646-18F, JD49646-19F, JD49646-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.2.2

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

08/12/22

Metal	JD49646-1F Original MS	Spikelot MPSPK2	QC % Rec	Limits	
Aluminum					
Antimony					
Arsenic	145	9680	10000	95.4	75-125
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49646-1F Original MS	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zirconium

Associated samples MP34561: JD49646-1F, JD49646-2F, JD49646-3F, JD49646-4F, JD49646-5F, JD49646-6F, JD49646-7F, JD49646-8F, JD49646-9F, JD49646-10F, JD49646-11F, JD49646-12F, JD49646-13F, JD49646-14F, JD49646-15F, JD49646-16F, JD49646-17F, JD49646-18F, JD49646-19F, JD49646-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49646-1F		Spikelot	% Rec	MSD	QC
	Original	MSD	MPSPK2		RPD	Limit
Aluminum						
Antimony						
Arsenic	145	9760	10000	96.2	0.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD49646  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 08/12/22

Metal	JD49646-1F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP34561: JD49646-1F, JD49646-2F, JD49646-3F, JD49646-4F, JD49646-5F, JD49646-6F, JD49646-7F, JD49646-8F, JD49646-9F, JD49646-10F, JD49646-11F, JD49646-12F, JD49646-13F, JD49646-14F, JD49646-15F, JD49646-16F, JD49646-17F, JD49646-18F, JD49646-19F, JD49646-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## 5.2.3

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## 5.2.3

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SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	JD49646-1F		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum				
Antimony				
Arsenic	28.9	36.3	25.6 (a)	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				



SERIAL DILUTION RESULTS SUMMARY

Login Number: JD49646  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34561  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 08/12/22

Metal	JD49646-1F	QC	
	Original SDL 1:5	%DIF	Limits

Zinc

Zirconium

Associated samples MP34561: JD49646-1F, JD49646-2F, JD49646-3F, JD49646-4F, JD49646-5F, JD49646-6F, JD49646-7F, JD49646-8F, JD49646-9F, JD49646-10F, JD49646-11F, JD49646-12F, JD49646-13F, JD49646-14F, JD49646-15F, JD49646-16F, JD49646-17F, JD49646-18F, JD49646-19F, JD49646-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD51013

Sampling Date: 08/31/22

Report to:

Sanborn Head & Associates, Inc.  
1015 Virginia Drive Suite 100  
Fort Washington, PA 19034  
swhitney@sanbornhead.com; cshepsko@sanbornhead.com

ATTN: Chelsey Shepsko

Total number of pages in report: 24



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in blue ink.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD51013

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD51013-1F	08/31/22	12:15	09/01/22	AQ	Groundwater Filtered	MW-56D_20220831
JD51013-2F	08/31/22	12:20	09/01/22	AQ	Groundwater Filtered	MW-560D_20220831
JD51013-3F	08/31/22	12:25	09/01/22	AQ	Groundwater Filtered	MW-606S_20220831
JD51013-4F	08/31/22	12:30	09/01/22	AQ	Groundwater Filtered	MW-608D_20220831
JD51013-5F	08/31/22	12:35	09/01/22	AQ	Groundwater Filtered	MW-609D_20220831

## Summary of Hits

Page 1 of 1

**Job Number:** JD51013  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 08/31/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>JD51013-1F</b>	<b>MW-56D_20220831</b>					
Arsenic		203000	300		ug/l	SW846 6010D
<b>JD51013-2F</b>	<b>MW-560D_20220831</b>					
Arsenic		27900	300		ug/l	SW846 6010D
<b>JD51013-3F</b>	<b>MW-606S_20220831</b>					
Arsenic		5580	30		ug/l	SW846 6010D
<b>JD51013-4F</b>	<b>MW-608D_20220831</b>					
Arsenic		525000	300		ug/l	SW846 6010D
<b>JD51013-5F</b>	<b>MW-609D_20220831</b>					
Arsenic		418000	300		ug/l	SW846 6010D

## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220831	<b>Date Sampled:</b>	08/31/22
<b>Lab Sample ID:</b>	JD51013-1F	<b>Date Received:</b>	09/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	203000	300	ug/l	100	09/04/22	09/07/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52950  
(2) Prep QC Batch: MP34934

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220831	<b>Date Sampled:</b>	08/31/22
<b>Lab Sample ID:</b>	JD51013-2F	<b>Date Received:</b>	09/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	27900	300	ug/l	100	09/04/22	09/07/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52950  
(2) Prep QC Batch: MP34934

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	MW-606S_20220831	<b>Date Sampled:</b>	08/31/22
<b>Lab Sample ID:</b>	JD51013-3F	<b>Date Received:</b>	09/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5580	30	ug/l	10	09/04/22	09/07/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52950  
(2) Prep QC Batch: MP34934

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220831	<b>Date Sampled:</b>	08/31/22
<b>Lab Sample ID:</b>	JD51013-4F	<b>Date Received:</b>	09/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	525000	300	ug/l	100	09/04/22	09/07/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52950  
(2) Prep QC Batch: MP34934

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220831	<b>Date Sampled:</b>	08/31/22
<b>Lab Sample ID:</b>	JD51013-5F	<b>Date Received:</b>	09/01/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	418000	300	ug/l	100	09/04/22	09/07/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52950  
(2) Prep QC Batch: MP34934

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

no bottle order

[illegible]

P:\4800s\4862.04 Analytical\2022-04 AOI-7 Soil\2022-04 SGS Soil COC.xlsx

Page 1 of 1

HNO<sub>3</sub> p1t 42

Sanborn, Head &amp; Associates, Inc.

## JD51013: Chain of Custody

Page 1 of 2

## SGS Sample Receipt Summary

**Job Number:** JD51013

**Client:** SANBORN HEAD & ASSOCIATES

**Project:** EVERGREEN MARCUS HOOK

**Date / Time Received:** 9/1/2022 5:30:00 PM

**Delivery Method:**
**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.8);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.4);

**Cooler Security**
**Y or N**
**Y or N**

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

**Quality Control Preservation**
**Y or N**
**N/A**

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**
**Y or N**

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Sample Integrity - Condition**
**Y or N**

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s:	pH 1-12: 231619	pH 12+: 203117A	Other: (Specify)
--------------------	-----------------	-----------------	------------------

Comments

SM089-03  
Rev. Date 12/7/17

JD51013: Chain of Custody

Page 2 of 2

## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD51013  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 09/04/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	1.0	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32		
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD51013  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 09/04/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.4	4.1		

Associated samples MP34934: JD51013-1F, JD51013-2F, JD51013-3F, JD51013-4F, JD51013-5F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## 5.1.2



Methods: SW846 6010D  
Units: ug/l

09/04/22



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD51013  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/04/22

Metal	JD51013-5F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP34934: JD51013-1F, JD51013-2F, JD51013-3F, JD51013-4F, JD51013-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## 5.1.2



Methods: SW846 6010D  
Units: ug/l

09/04/22

Page 3

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD51013  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/04/22

Metal	JD51013-5F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
-------	----------------------------	--------------------	-------	------------	-------------

Zinc

Zirconium

Associated samples MP34934: JD51013-1F, JD51013-2F, JD51013-3F, JD51013-4F, JD51013-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## 5.1.3

Prep Date: 09/04/22

Page 1

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD51013  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/04/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP34934: JD51013-1F, JD51013-2F, JD51013-3F, JD51013-4F, JD51013-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD51013  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/04/22

Metal	JD51013-5F			QC	
	Original	SDL	100:500%DIF	Limits	

Aluminum					
Antimony					
Arsenic	418000	452000	8.2	0-10	
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron					
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					



# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD51013  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP34934  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/04/22

Metal	JD51013-5F	QC
	Original SDL 100:500%DIF	Limits

Zinc

Zirconium

Associated samples MP34934: JD51013-1F, JD51013-2F, JD51013-3F, JD51013-4F, JD51013-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD52574

Sampling Date: 09/23/22



Report to:

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Total number of pages in report: 75



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

Sunoco/Evergreen

Job No: JD52574

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD52574-1F	09/23/22	08:00	09/26/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D C1
JD52574-2F	09/23/22	08:15	09/26/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D C1-DUP
JD52574-3F	09/23/22	08:30	09/26/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3
JD52574-4F	09/23/22	08:45	09/26/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3-DUP
JD52574-5F	09/23/22	09:00	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S C1
JD52574-6F	09/23/22	09:15	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S C1-DUP
JD52574-7F	09/23/22	09:30	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3
JD52574-8F	09/23/22	09:45	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3-DUP
JD52574-9F	09/23/22	10:00	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D C1
JD52574-10F	09/23/22	10:15	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D C1-DUP
JD52574-11F	09/23/22	10:30	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D T3
JD52574-12F	09/23/22	10:45	09/26/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D T3-DUP
JD52574-13F	09/23/22	11:00	09/26/22	AQ	Groundwater Filtered	SOIL AOI7 BH22 20-28' GW MW-56D C1



Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD52574

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD52574-14F	09/23/22	11:15	09/26/22	AQ	Groundwater Filtered	SOIL AOI7 BH22 20-28' GW MW-56D C1-DUP
JD52574-15F	09/23/22	11:30	09/26/22	AQ	Groundwater Filtered	SOIL AOI7 BH22 20-28' GW MW-56D T3
JD52574-16F	09/23/22	11:45	09/26/22	AQ	Groundwater Filtered	SOIL AOI7 BH22 20-28' GW MW-56D T3-DUP
JD52574-17F	09/23/22	14:00	09/26/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D C1
JD52574-18F	09/23/22	14:15	09/26/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D C1-DUP
JD52574-19F	09/23/22	14:30	09/26/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3
JD52574-20F	09/23/22	14:45	09/26/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3-DUP

## Summary of Hits

Page 1 of 5

**Job Number:** JD52574  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/23/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

### JD52574-1F SOIL MW-560 15-25' GW MW-560D C1

Antimony <sup>a</sup>	24.6	24		ug/l	SW846 6010D
Arsenic	4710	6.0		ug/l	SW846 6010D
Manganese	2530	30		ug/l	SW846 6010D
Zinc	146	40		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	1.6	0.25		mg/l	EPA 365.3

### JD52574-2F SOIL MW-560 15-25' GW MW-560D C1-DUP

Arsenic	3480	3.0		ug/l	SW846 6010D
Iron	557	100		ug/l	SW846 6010D
Lead	4.3	3.0		ug/l	SW846 6010D
Manganese	3520	15		ug/l	SW846 6010D
Nickel	15.4	10		ug/l	SW846 6010D
Zinc	128	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	1.6	0.25		mg/l	EPA 365.3

### JD52574-3F SOIL MW-560 15-25' GW MW-560D T3

Arsenic <sup>a</sup>	324	30		ug/l	SW846 6010D
Copper	55.4	10		ug/l	SW846 6010D
Nickel	54.3	10		ug/l	SW846 6010D
Selenium	13.1	10		ug/l	SW846 6010D
Zinc	21.8	20		ug/l	SW846 6010D

### JD52574-4F SOIL MW-560 15-25' GW MW-560D T3-DUP

Arsenic <sup>a</sup>	346	30		ug/l	SW846 6010D
Copper	49.6	10		ug/l	SW846 6010D
Nickel	49.7	10		ug/l	SW846 6010D
Zinc	21.0	20		ug/l	SW846 6010D
Sulfate	233	2.0		mg/l	EPA 300/SW846 9056A

### JD52574-5F SOIL MW-608D 10-15' GW MW-606S C1

Arsenic <sup>a</sup>	170	60		ug/l	SW846 6010D
Cadmium	4.0	3.0		ug/l	SW846 6010D
Iron	8070	100		ug/l	SW846 6010D
Manganese	3140	15		ug/l	SW846 6010D
Nickel	44.9	10		ug/l	SW846 6010D
Zinc	424	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.12	0.10		mg/l	EPA 365.3
Sulfate	2820	28		mg/l	EPA 300/SW846 9056A

## Summary of Hits

**Job Number:** JD52574  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/23/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

### JD52574-6F SOIL MW-608D 10-15' GW MW-606S C1-DUP

Arsenic <sup>a</sup>	147	60		ug/l	SW846 6010D
Cadmium	3.8	3.0		ug/l	SW846 6010D
Iron	3060	100		ug/l	SW846 6010D
Manganese	3290	15		ug/l	SW846 6010D
Mercury	0.35	0.20		ug/l	SW846 7470A
Nickel	50.3	10		ug/l	SW846 6010D
Zinc	359	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.32	0.10		mg/l	EPA 365.3

### JD52574-7F SOIL MW-608D 10-15' GW MW-606S T3

Arsenic <sup>a</sup>	84.3	30		ug/l	SW846 6010D
Copper	12.9	10		ug/l	SW846 6010D
Iron	201	100		ug/l	SW846 6010D
Nickel	20.6	10		ug/l	SW846 6010D
Selenium <sup>a</sup>	241	100		ug/l	SW846 6010D
Sulfate	2180	22		mg/l	EPA 300/SW846 9056A

### JD52574-8F SOIL MW-608D 10-15' GW MW-606S T3-DUP

Arsenic <sup>a</sup>	93.7	30		ug/l	SW846 6010D
Copper	11.0	10		ug/l	SW846 6010D
Iron	222	100		ug/l	SW846 6010D
Selenium <sup>a</sup>	239	100		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.078	0.050		mg/l	EPA 365.3
Sulfate	2460	24		mg/l	EPA 300/SW846 9056A

### JD52574-9F SOIL MW-608D 25-33' GW MW-608D C1

Antimony <sup>a</sup>	302	60		ug/l	SW846 6010D
Arsenic	377000	300		ug/l	SW846 6010D
Iron	2180	100		ug/l	SW846 6010D
Lead <sup>a</sup>	129	30		ug/l	SW846 6010D
Manganese	1030	15		ug/l	SW846 6010D
Mercury	0.34	0.20		ug/l	SW846 7470A
Nickel	47.9	10		ug/l	SW846 6010D
Zinc	110	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	117	25		mg/l	EPA 365.3
Sulfate	2110	20		mg/l	EPA 300/SW846 9056A

### JD52574-10F SOIL MW-608D 25-33' GW MW-608D C1-DUP

Antimony <sup>a</sup>	176	60		ug/l	SW846 6010D
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## Summary of Hits

**Job Number:** JD52574  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/23/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Arsenic		422000	300		ug/l	SW846 6010D
Iron		2270	100		ug/l	SW846 6010D
Lead <sup>a</sup>		148	30		ug/l	SW846 6010D
Manganese		894	15		ug/l	SW846 6010D
Mercury		0.48	0.20		ug/l	SW846 7470A
Nickel		31.9	10		ug/l	SW846 6010D
Zinc		38.7	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>		128	25		mg/l	EPA 365.3
Sulfate		2000	20		mg/l	EPA 300/SW846 9056A

### JD52574-11F SOIL MW-608D 25-33' GW MW-608D T3

Arsenic	9670	30		ug/l	SW846 6010D
Iron	196	100		ug/l	SW846 6010D
Mercury	3.3	0.20		ug/l	SW846 7470A
Nickel	33.2	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.91	0.10		mg/l	EPA 365.3
Sulfate	1940	20		mg/l	EPA 300/SW846 9056A

### JD52574-12F SOIL MW-608D 25-33' GW MW-608D T3-DUP

Antimony <sup>a</sup>	137	60		ug/l	SW846 6010D
Arsenic	16500	30		ug/l	SW846 6010D
Iron	173	100		ug/l	SW846 6010D
Mercury	13.9	1.0		ug/l	SW846 7470A
Nickel	25.9	10		ug/l	SW846 6010D
Selenium <sup>a</sup>	138	100		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.70	0.10		mg/l	EPA 365.3
Sulfate	1910	20		mg/l	EPA 300/SW846 9056A

### JD52574-13F SOIL AOI7 BH22 20-28' GW MW-56D C1

Antimony <sup>a</sup>	43.7	30		ug/l	SW846 6010D
Arsenic	77000	60		ug/l	SW846 6010D
Iron	13900	100		ug/l	SW846 6010D
Manganese	3470	15		ug/l	SW846 6010D
Nickel	30.5	10		ug/l	SW846 6010D
Zinc	110	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	11.4	5.0		mg/l	EPA 365.3
Sulfate	571	6.0		mg/l	EPA 300/SW846 9056A

### JD52574-14F SOIL AOI7 BH22 20-28' GW MW-56D C1-DUP

Arsenic	72000	60		ug/l	SW846 6010D
Iron	18000	100		ug/l	SW846 6010D



## Summary of Hits

**Job Number:** JD52574  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/23/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Manganese		3330	15		ug/l	SW846 6010D
Nickel		23.9	10		ug/l	SW846 6010D
Zinc		88.1	20		ug/l	SW846 6010D
Sulfate		667	6.0		mg/l	EPA 300/SW846 9056A

### JD52574-15F SOIL AOI7 BH22 20-28' GW MW-56D T3

Antimony <sup>a</sup>		39.7	30		ug/l	SW846 6010D
Arsenic <sup>a</sup>		7390	15		ug/l	SW846 6010D
Iron		205	100		ug/l	SW846 6010D
Mercury		3.6	0.20		ug/l	SW846 7470A
Selenium		27.6	10		ug/l	SW846 6010D
Sulfate		270	2.0		mg/l	EPA 300/SW846 9056A

### JD52574-16F SOIL AOI7 BH22 20-28' GW MW-56D T3-DUP

Antimony <sup>a</sup>		30.4	12		ug/l	SW846 6010D
Arsenic <sup>a</sup>		5640	6.0		ug/l	SW846 6010D
Iron		501	100		ug/l	SW846 6010D
Mercury		0.63	0.20		ug/l	SW846 7470A
Nickel		21.9	10		ug/l	SW846 6010D
Selenium		44.1	10		ug/l	SW846 6010D
Sulfate		221	2.0		mg/l	EPA 300/SW846 9056A

### JD52574-17F SOIL MW-609D 18-23' GW MW-609D C1

Antimony <sup>a</sup>		245	60		ug/l	SW846 6010D
Arsenic		245000	150		ug/l	SW846 6010D
Iron		829	100		ug/l	SW846 6010D
Lead <sup>a</sup>		33.9	30		ug/l	SW846 6010D
Manganese		1420	15		ug/l	SW846 6010D
Nickel		38.7	10		ug/l	SW846 6010D
Zinc		231	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>		59.6	10		mg/l	EPA 365.3
Sulfate		1920	20		mg/l	EPA 300/SW846 9056A

### JD52574-18F SOIL MW-609D 18-23' GW MW-609D C1-DUP

Antimony <sup>a</sup>		145	60		ug/l	SW846 6010D
Arsenic		198000	150		ug/l	SW846 6010D
Iron		3600	100		ug/l	SW846 6010D
Manganese		1530	15		ug/l	SW846 6010D
Nickel		25.8	10		ug/l	SW846 6010D
Zinc		80.9	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>		30.8	5.0		mg/l	EPA 365.3

## Summary of Hits

**Job Number:** JD52574  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/23/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Sulfate		2050	20		mg/l	EPA 300/SW846 9056A
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### JD52574-19F SOIL MW-609D 18-23' GW MW-609D T3

Arsenic		13500	30		ug/l	SW846 6010D
Mercury		0.30	0.20		ug/l	SW846 7470A
Nickel		19.0	10		ug/l	SW846 6010D
Sulfate		1730	18		mg/l	EPA 300/SW846 9056A

### JD52574-20F SOIL MW-609D 18-23' GW MW-609D T3-DUP

Antimony <sup>a</sup>		64.4	60		ug/l	SW846 6010D
Arsenic		8810	30		ug/l	SW846 6010D
Mercury		0.35	0.20		ug/l	SW846 7470A
Nickel		14.0	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>		0.22	0.10		mg/l	EPA 365.3
Sulfate		1780	18		mg/l	EPA 300/SW846 9056A

(a) Elevated detection limit due to dilution required for high interfering element.

(b) Sample received outside the holding time.

## Sample Results

## Report of Analysis

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D C1**Lab Sample ID:** JD52574-1F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	24.6	24	ug/l	2	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	4710	6.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 6.0	6.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 100	100	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	< 200	200	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead	< 6.0	6.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Manganese	2530	30	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	146	40	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D C1	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-1F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.6	0.25	mg/l	5	09/30/22 14:35	MP	EPA 365.3

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D C1-DUP**Lab Sample ID:** JD52574-2F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 30	30	ug/l	5	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	3480	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	557	100	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead	4.3	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Manganese	3520	15	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	15.4	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	128	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D C1-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-2F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.6	0.25	mg/l	5	09/30/22 14:35	MP	EPA 365.3

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3**Lab Sample ID:** JD52574-3F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	324	30	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	55.4	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	< 100	100	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	54.3	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	13.1	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	21.8	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D T3	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-3F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.25	0.25	mg/l	5	09/30/22 14:35	MP	EPA 365.3

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3-DUP**Lab Sample ID:** JD52574-4F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	346	30	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	49.6	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	< 100	100	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	49.7	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	21.0	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D T3-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-4F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.050	0.050	mg/l	1	09/30/22 14:35	MP	EPA 365.3
Sulfate	233	2.0	mg/l	1	10/05/22 22:36	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S C1**Lab Sample ID:** JD52574-5F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	170	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	4.0	3.0	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	8070	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	3140	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	44.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	424	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C1	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-5F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.12	0.10	mg/l	2	09/30/22 14:35	MP	EPA 365.3
Sulfate	2820	28	mg/l	14	10/06/22 14:44	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S C1-DUP**Lab Sample ID:** JD52574-6F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	147	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	3.8	3.0	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	3060	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	3290	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.35	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	50.3	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	359	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C1-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-6F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.32	0.10	mg/l	2	09/30/22 14:35	MP	EPA 365.3

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S T3**Lab Sample ID:** JD52574-7F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	84.3	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	12.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	201	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	20.6	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	241	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-7F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.050	0.050	mg/l	1	09/30/22 15:00	MP	EPA 365.3
Sulfate	2180	22	mg/l	11	10/06/22 14:57	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S T3-DUP**Lab Sample ID:** JD52574-8F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	93.7	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	11.0	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	222	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	239	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-8F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.078	0.050	mg/l	1	09/30/22 15:00	MP	EPA 365.3
Sulfate	2460	24	mg/l	12	10/06/22 15:10	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 25-33' GW MW-608D C1**Lab Sample ID:** JD52574-9F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	302	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	377000	300	ug/l	100	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 300	300	ug/l	100	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	2180	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	129	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	1030	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.34	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	47.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	110	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D C1	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-9F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	117	25	mg/l	500	09/30/22 15:00	MP	EPA 365.3
Sulfate	2110	20	mg/l	10	10/06/22 15:49	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 25-33' GW MW-608D C1-DUP**Lab Sample ID:** JD52574-10F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	176	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	422000	300	ug/l	100	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 300	300	ug/l	100	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	2270	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	148	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	894	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.48	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	31.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	38.7	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D C1-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-10F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	128	25	mg/l	500	09/30/22 15:00	MP	EPA 365.3
Sulfate	2000	20	mg/l	10	10/06/22 16:02	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 25-33' GW MW-608D T3**Lab Sample ID:** JD52574-11F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA**Dissolved Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	9670	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	196	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	3.3	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	33.2	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D T3	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-11F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.91	0.10	mg/l	2	09/30/22 15:00	MP	EPA 365.3
Sulfate	1940	20	mg/l	10	10/06/22 16:16	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 25-33' GW MW-608D T3-DUP**Lab Sample ID:** JD52574-12F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	137	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	16500	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	173	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	13.9	1.0	ug/l	5	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	25.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	138	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D T3-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-12F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.70	0.10	mg/l	2	09/30/22 15:00	MP	EPA 365.3
Sulfate	1910	20	mg/l	10	10/06/22 16:29	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AOI7 BH22 20-28' GW MW-56D C1**Lab Sample ID:** JD52574-13F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	43.7	30	ug/l	5	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	77000	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	13900	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 15	15	ug/l	5	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	3470	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	30.5	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 50	50	ug/l	5	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 50	50	ug/l	5	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	110	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AOI7 BH22 20-28' GW MW-56D C1	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-13F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	11.4	5.0	mg/l	100	09/30/22 15:00	MP	EPA 365.3
Sulfate	571	6.0	mg/l	3	10/06/22 16:42	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AOI7 BH22 20-28' GW MW-56D C1-DUP**Lab Sample ID:** JD52574-14F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	72000	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	18000	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	3330	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	23.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	88.1	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AOI7 BH22 20-28' GW MW-56D C1-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-14F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	2	09/30/22 15:00	MP	EPA 365.3
Sulfate	667	6.0	mg/l	3	10/06/22 16:54	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AOI7 BH22 20-28' GW MW-56D T3**Lab Sample ID:** JD52574-15F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	39.7	30	ug/l	5	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	7390	15	ug/l	5	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	205	100	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 15	15	ug/l	5	09/30/22	10/07/22 MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	3.6	0.20	ug/l	1	09/29/22	09/30/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	27.6	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 10	10	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL AOI7 BH22 20-28' GW MW-56D T3	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-15F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	2	09/30/22 15:00	MP	EPA 365.3
Sulfate	270	2.0	mg/l	1	10/06/22 01:50	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AOI7 BH22 20-28' GW MW-56D T3-DUP**Lab Sample ID:** JD52574-16F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	30.4	12	ug/l	2	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic <sup>a</sup>	5640	6.0	ug/l	2	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium	< 3.0	3.0	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	501	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 6.0	6.0	ug/l	2	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.63	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	21.9	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	44.1	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AOI7 BH22 20-28' GW MW-56D T3-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-16F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	2	09/30/22 15:00	MP	EPA 365.3
Sulfate	221	2.0	mg/l	1	10/06/22 02:03	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D C1**Lab Sample ID:** JD52574-17F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	245	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	245000	150	ug/l	50	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 150	150	ug/l	50	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	829	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	33.9	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	1420	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	38.7	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	231	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D C1	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-17F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	59.6	10	mg/l	200	09/30/22 15:20	MP	EPA 365.3
Sulfate	1920	20	mg/l	10	10/06/22 17:07	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D C1-DUP**Lab Sample ID:** JD52574-18F**Matrix:** AQ - Groundwater Filtered**Project:** SANHPAFW: Marcus Hook, PA**Date Sampled:** 09/23/22**Date Received:** 09/26/22**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	145	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	198000	150	ug/l	50	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 150	150	ug/l	50	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	3600	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	1530	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	25.8	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	80.9	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D C1-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-18F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	30.8	5.0	mg/l	100	09/30/22 15:20	MP	EPA 365.3
Sulfate	2050	20	mg/l	10	10/06/22 17:20	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D T3**Lab Sample ID:** JD52574-19F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	13500	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	< 100	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.30	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	19.0	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-19F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	2	09/30/22 15:20	MP	EPA 365.3
Sulfate	1730	18	mg/l	9	10/06/22 17:33	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D T3-DUP**Lab Sample ID:** JD52574-20F**Date Sampled:** 09/23/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/26/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	64.4	60	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Arsenic	8810	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	< 100	100	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.35	0.20	ug/l	1	09/29/22	09/30/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	14.0	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	09/30/22	10/07/22	MET	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	09/30/22	10/05/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53066

(2) Instrument QC Batch: MA53098

(3) Instrument QC Batch: MA53114

(4) Prep QC Batch: MP35416

(5) Prep QC Batch: MP35429

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3-DUP	<b>Date Sampled:</b>	09/23/22
<b>Lab Sample ID:</b>	JD52574-20F	<b>Date Received:</b>	09/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.22	0.10	mg/l	2	09/30/22 15:20	MP	EPA 365.3
Sulfate	1780	18	mg/l	9	10/06/22 17:46	SS	EPA 300/SW846 9056A

(a) Sample received outside the holding time.

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms


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Includes the following where applicable:

- Chain of Custody

GW

SGS		CHAIN OF CUSTODY		Page 1 of 2	
SGS North America Inc. - Dayton		2235 Route 130, Dayton, NJ 08810		TEL: 732-329-0200 FAX: 732-329-3499	
Company Name Santborn Head & Associates		Project Name Evergreen Marcus Hook		Matrix Codes	
Street Address 1015 Virginia Dr, Suite 100		Street 100 Green Street		DW - Drinking Water GW - Ground Water WW - Wastewater SW - Surface Water SO - Soil SL - Sludge SED - Sediment LIQ - Other Liquid AUR Air SOL - Other Solid WVP Wipe F&B - Field Blank EQ - Equipment Blank RB - Room Blank TS - Trip Blank	
City Fort Washington, PA, 19034		City Concord, NH, 03301		State NH	
Phone # 603-415-6159		Client Purchase Order #		Zip 03301	
E-mail swhitney@santbornhead.com		Project # 4862 04		Street Address 20 Foundry Street	
Project Contact Santborn Head & Associates		Project Manager Chelsy Shepsko		Account Payable sp@santbornhead.com	
Lab Sample #		Field ID / Point of Collection		MEOWDI Val #	
Date		Time		Sampled by	
Matrix		# of bottles		Number of preserved bottles	
C1		C2		C3	
C4		C5		C6	
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C751		C752		C753	
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**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL 732-329-0200 FAX 732-329-3499

Page 2 of 2  
 Please merge with SDG:

JD52574

<b>Company Name</b> Sanborn Head & Associates <b>Street Address</b> 1015 Virginia Dr. Suite 100 <b>City</b> <b>State</b> <b>Zip</b> Fort Washington, PA, 19034 <b>Project Contact</b> Shana Whitney ewhitney@sanbornhead.com <b>Phone #</b> 603-415-1159		<b>Project Name</b> Evergreen Marcus Hook <b>Street</b> 100 Green Street <b>City</b> <b>State</b> Marcus Hook, DE 19661 <b>Project #</b> 4862.04 <b>Client Purchase Order #</b>  <b>Project Manager</b> Chelsey Shepsko <b>Address:</b> Chelsey Shepsko (chelshe@sanbornhead.com) <b>Accounts Payable:</b> ewhitney@sanbornhead.com		<b>Billing Information (if different from Report to)</b> <b>Company Name</b> Sanborn Head & Associates <b>Street Address</b> 20 Foundry Street <b>City</b> <b>State</b> <b>Zip</b> Concord, NH, 03301 <b>Matrix Codes</b> DW - Drinking Water GW - Ground Water WW - Wastewater SW - Surface Water SO - Soil SL - Sludge SED Sediment OI - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Wipe FB-Field Blank ES Equipment Blank RB- Rinse Blank TB Trip Blank <b>LAB USE ONLY</b>	
<b>Turnaround Time (Business days)</b> <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____ Emergency & Rush TIA data available via LabLink		<b>Approved by (SGS Project Manager):</b> _____ <b>Commercial "A" (Level 1)</b> Commercial "B" (Level 2) FULLT1 (Level 3+4) NJ Reduced X REDT1 X EDO Format SHA EGUS; Starlec EGUS <b>Commercial "C"</b> NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		<b>Data Deliverable Information</b> NYASP Category A NYASP Category B State Forms Comments / Special Instructions	
<b>Signature of Client</b> [Signature] <b>Date/Time</b> 9/26/22 12:05		<b>Signature of SGS</b> [Signature] <b>Date/Time</b> 9/26/22 12:18		<b>Signature of SGS</b> [Signature] <b>Date/Time</b> 9/26/22 12:18	

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Sanborn, Head & Associates, Inc.

JD52574: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: JD52574

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN MARCUS HOOK

Date / Time Received: 9/26/2022 6:15:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (2.9);

Cooler Temps (Corrected) °C: Cooler 1: (3.5);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD52574: Chain of Custody

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Job Change Order: JD52574

Requested Date:	10/6/2022	Received Date:	9/26/2022
Account Name:	Sunoco/Evergreen	Due Date:	10/6/2022
Project Description:	SANHPAFW: Marcus Hook, PA	Deliverable:	COMMB
C/O Initiated By:	SHALINI.WI	PM:	VP
		TAT (Days):	1

=====

Sample #: JD52574-1F, 3F, 6F      Change: Cancel SO4 since sample were depleted

Dept:

TAT: 1

=====

Above Changes Per: shalini williams      Date/Time: 10/6/2022

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.



## Job Change Order: JD52574

<b>Requested Date:</b>	10/6/2022	<b>Received Date:</b>	9/26/2022
<b>Account Name:</b>	Sunoco/Evergreen	<b>Due Date:</b>	10/6/2022
<b>Project Description:</b>	SANHPAFW: Marcus Hook, PA	<b>Deliverable:</b>	COMMB
<b>C/O Initiated By:</b>	SHALINI.WI	<b>TAT (Days):</b>	1
		<b>PM:</b>	VP

**Sample #:** JD52574-2F

Don't:  
Cancel S04 since sample were depleted

TAT: 1

SOIL MW-560 15-25' GW MW-560D C1-D

**Above Changes Per:** SHALINI WILLIAMS      **Date/Time:** 10/6/2022

**To Client:** This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

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## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 09/30/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7	0.40	<6.0
Arsenic	3.0	2.1	2.8	-0.10	<3.0
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1	0.0	<3.0
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6	0.10	<50
Copper	10	.8	5.9	0.80	<10
Iron	100	5.3	32	1.6	<100
Lead	3.0	1.1	1.8	-1.3	<3.0
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4	0.30	<15
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7	-0.20	<10
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9	0.10	<10
Silicon	200	1.7	32		
Silver	10	1	6.1	-0.10	<10
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8	-1.3	<10
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 09/30/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9	1.0	<20
Zirconium	10	.3	4.1		

Associated samples MP35416: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original MS		SpikeLot MPSPK2	% Rec	QC Limits
Aluminum					
Antimony	24.6	3920	4000	97.4	75-125
Arsenic	4710	8420	4000	92.8	75-125
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	0.0	3910	4000	97.8	75-125
Calcium					
Cerium					
Chromium					
Cobalt	8.8	3810	4000	95.0	75-125
Copper	0.0	3750	4000	93.7	75-125
Iron	193	49600	50000	98.8	75-125
Lead	0.0	3790	4000	94.8	75-125
Lithium					
Magnesium					
Manganese	2530	6230	4000	92.5	75-125
Molybdenum					
Nickel	14.8	3830	4000	95.4	75-125
Phosphorus					
Potassium					
Selenium	0.0	3830	4000	95.8	75-125
Silicon					
Silver	0.0	460	500	92.0	75-125
Sodium					
Strontium					
Sulfur					
Thallium	0.0	3750	4000	93.8	75-125
Tin					
Titanium					
Tungsten					
Vanadium					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original MS	Spikelot MPSPK2	% Rec	QC Limits
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Zinc 146 3980 4000 95.9 75-125

Zirconium

Associated samples MP35416: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	24.6	4180	4000	103.9	6.4	20
Arsenic	4710	8740	4000	100.8	3.7	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium	0.0	3990	4000	99.8	2.0	20
Calcium						
Cerium						
Chromium						
Cobalt	8.8	3890	4000	97.0	2.1	20
Copper	0.0	3830	4000	95.7	2.1	20
Iron	193	51200	50000	102.0	3.2	20
Lead	0.0	3870	4000	96.8	2.1	20
Lithium						
Magnesium						
Manganese	2530	6510	4000	99.5	4.4	20
Molybdenum						
Nickel	14.8	3910	4000	97.4	2.1	20
Phosphorus						
Potassium						
Selenium	0.0	3900	4000	97.5	1.8	20
Silicon						
Silver	0.0	469	500	93.8	1.9	20
Sodium						
Strontium						
Sulfur						
Thallium	0.0	3810	4000	95.3	1.6	20
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc	146	4060	4000	97.9	2.0	20
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Zirconium

Associated samples MP35416: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52574

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

09/30/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony	1950	2000	97.5	80-120
Arsenic	1930	2000	96.5	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	1980	2000	99.0	80-120
Calcium				
Cerium				
Chromium				
Cobalt	1950	2000	97.5	80-120
Copper	1950	2000	97.5	80-120
Iron	25900	25000	103.6	80-120
Lead	1960	2000	98.0	80-120
Lithium				
Magnesium				
Manganese	1990	2000	99.5	80-120
Molybdenum				
Nickel	1950	2000	97.5	80-120
Phosphorus				
Potassium				
Selenium	1950	2000	97.5	80-120
Silicon				
Silver	236	250	94.4	80-120
Sodium				
Strontium				
Sulfur				
Thallium	2040	2000	102.0	80-120
Tin				
Titanium				
Tungsten				
Vanadium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc	1980	2000	99.0	80-120
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Zirconium

Associated samples MP35416: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	12.3	0.00	100.0 (a)	0-10
Arsenic	2350	2340	0.6	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	0.00	0.00	NC	0-10
Calcium				
Cerium				
Chromium				
Cobalt	4.40	4.20	4.5	0-10
Copper	0.00	0.00	NC (a)	0-10
Iron	96.7	108	11.7 (a)	0-10
Lead	0.00	0.00	NC	0-10
Lithium				
Magnesium				
Manganese	1270	1320	4.4	0-10
Molybdenum				
Nickel	7.40	7.40	0.0	0-10
Phosphorus				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Sulfur				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35416  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 09/30/22

Metal	JD52574-1F Original	SDL 1:5	%DIF	QC Limits
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Zinc	72.8	75.9	4.3	0-10
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Zirconium

Associated samples MP35416: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35429  
Matrix Type: AQUEOUS

Methods: SW846 7470A  
Units: ug/l

Prep Date: 09/29/22

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.20	.024	.095	0.0050	<0.20

Associated samples MP35429: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35429  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 09/29/22

Metal	JD52574-1F Original MS	Spikelot HGPW3	% Rec	QC Limits
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Mercury 0.0 1.1 2 55.0N(a) 75-125

Associated samples MP35429: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35429  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 09/29/22

Metal	JD52574-1F Original MSD	Spikelot HGPW3	% Rec	MSD RPD	QC Limit
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Mercury	0.0	1.1	2	55.0N(a)	0.0	20
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Associated samples MP35429: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52574  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35429  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 09/29/22

Metal	BSP Result	Spikelot HGPW3	% Rec	QC Limits
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Mercury	2.0	2	100.0	80-120
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Associated samples MP35429: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP42677/GN34100	2.0	0.0	mg/l	80	78.3	97.9	90-110%
Fluoride	GP42677/GN34100	0.20	0.0	mg/l	2	1.85	92.5	90-110%
Phosphate, Ortho	GN33903	0.050	0.0	mg/l	0.2	0.19	95.0	90-110%
Sulfate	GP42677/GN34100	2.0	0.0	mg/l	80	78.3	97.9	90-110%

Associated Samples:  
Batch GN33903: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F  
Batch GP42677: JD52574-4F, JD52574-5F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP42677/GN34100	JD52552-1B	mg/l	1.2	1.2	0.0	0-20%
Fluoride	GP42677/GN34100	JD52552-1B	mg/l	0.0	0.0	0.0	0-20%
Phosphate, Ortho	GN33903	JD52574-3F	mg/l	0.0	0.18	200.0 (a)	0-23%
Sulfate	GP42677/GN34100	JD52552-1B	mg/l	1.7	1.7	0.0	0-20%

Associated Samples:

Batch GN33903: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Batch GP42677: JD52574-4F, JD52574-5F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

(\*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52574  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP42677/GN34100	JD52552-1B	mg/l	1.2	80	78.7	96.9	80-120%
Fluoride	GP42677/GN34100	JD52552-1B	mg/l	0.0	2	1.8	90.0	80-120%
Phosphate, Ortho	GN33903	JD52574-3F	mg/l	0.0	0.2	0.19	95.0	25-150%
Sulfate	GP42677/GN34100	JD52552-1B	mg/l	1.7	80	79.4	97.1	80-120%

Associated Samples:

Batch GN33903: JD52574-1F, JD52574-2F, JD52574-3F, JD52574-4F, JD52574-5F, JD52574-6F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

Batch GP42677: JD52574-4F, JD52574-5F, JD52574-7F, JD52574-8F, JD52574-9F, JD52574-10F, JD52574-11F, JD52574-12F, JD52574-13F, JD52574-14F, JD52574-15F, JD52574-16F, JD52574-17F, JD52574-18F, JD52574-19F, JD52574-20F

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD52888

Sampling Date: 09/30/22



Report to:

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Total number of pages in report: **64**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

Sunoco/Evergreen

Job No: JD52888

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD52888-1F	09/30/22	08:00	09/30/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3 DAY 14
JD52888-2F	09/30/22	08:15	09/30/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 14
JD52888-3F	09/30/22	08:30	09/30/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3 DAY 14
JD52888-4F	09/30/22	08:45	09/30/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3-DUP DAY 14
JD52888-5F	09/30/22	09:00	09/30/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D T3 DAY 14
JD52888-6F	09/30/22	09:15	09/30/22	AQ	Groundwater Filtered	SOIL MW-608D 25-33' GW MW-608D T3-DUP DAY 14
JD52888-7F	09/30/22	09:30	09/30/22	AQ	Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 14
JD52888-8F	09/30/22	09:45	09/30/22	AQ	Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D T3-DUP DAY 14
JD52888-9F	09/30/22	10:00	09/30/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3 DAY 14
JD52888-10F	09/30/22	10:15	09/30/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3-DUP DAY 14

## Summary of Hits

**Job Number:** JD52888  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD52888-1F SOIL MW-560 15-25' GW MW-560D T3 DAY 14

Arsenic	1730	3.0		ug/l	SW846 6010D
Copper	35.1	10		ug/l	SW846 6010D
Lead	3.4	3.0		ug/l	SW846 6010D
Nickel	110	10		ug/l	SW846 6010D
Selenium	34.5	10		ug/l	SW846 6010D

### JD52888-2F SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 14

Arsenic	1650	3.0		ug/l	SW846 6010D
Copper	41.7	10		ug/l	SW846 6010D
Lead	4.5	3.0		ug/l	SW846 6010D
Nickel	90.1	10		ug/l	SW846 6010D
Selenium	34.9	10		ug/l	SW846 6010D
Zinc	40.6	20		ug/l	SW846 6010D
Sulfate	242	2.0		mg/l	EPA 300/SW846 9056A

### JD52888-3F SOIL MW-608D 10-15' GW MW-606S T3 DAY 14

Arsenic <sup>a</sup>	277	30		ug/l	SW846 6010D
Copper	19.8	10		ug/l	SW846 6010D
Iron	203	100		ug/l	SW846 6010D
Nickel	16.2	10		ug/l	SW846 6010D
Selenium <sup>a</sup>	157	100		ug/l	SW846 6010D
Sulfate	1870	18		mg/l	EPA 300/SW846 9056A

### JD52888-4F SOIL MW-608D 10-15' GW MW-606S T3-DUP DAY 14

Arsenic	660	15		ug/l	SW846 6010D
Selenium <sup>a</sup>	128	100		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	0.11	0.10		mg/l	EPA 365.3
Sulfate	1840	18		mg/l	EPA 300/SW846 9056A

### JD52888-5F SOIL MW-608D 25-33' GW MW-608D T3 DAY 14

Antimony <sup>a</sup>	212	120		ug/l	SW846 6010D
Arsenic	92500	60		ug/l	SW846 6010D
Cadmium <sup>a</sup>	70.4	60		ug/l	SW846 6010D
Iron	303	100		ug/l	SW846 6010D
Nickel	21.9	10		ug/l	SW846 6010D
Zinc	23.2	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	5.5	1.3		mg/l	EPA 365.3
Sulfate	2730	26		mg/l	EPA 300/SW846 9056A



## Summary of Hits

**Job Number:** JD52888  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 09/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD52888-6F SOIL MW-608D 25-33' GW MW-608D T3-DUP DAY 14

Antimony <sup>a</sup>	173	120		ug/l	SW846 6010D
Arsenic	75100	60		ug/l	SW846 6010D
Iron	295	100		ug/l	SW846 6010D
Lead <sup>a</sup>	62.0	60		ug/l	SW846 6010D
Nickel	26.3	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	4.3	1.3		mg/l	EPA 365.3
Sulfate	2700	24		mg/l	EPA 300/SW846 9056A

### JD52888-7F SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 14

Antimony	36.3	6.0		ug/l	SW846 6010D
Arsenic	20100	15		ug/l	SW846 6010D
Iron	342	100		ug/l	SW846 6010D
Lead	12.2	3.0		ug/l	SW846 6010D
Nickel	15.8	10		ug/l	SW846 6010D
Selenium	21.3	10		ug/l	SW846 6010D
Thallium	17.1	10		ug/l	SW846 6010D
Zinc	23.3	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	1.7	0.25		mg/l	EPA 365.3
Sulfate	210	2.0		mg/l	EPA 300/SW846 9056A

### JD52888-8F SOIL AO17 BH22 20-28' GW MW-56D T3-DUP DAY 14

Antimony	23.0	6.0		ug/l	SW846 6010D
Arsenic	15600	15		ug/l	SW846 6010D
Iron	224	100		ug/l	SW846 6010D
Lead	8.9	3.0		ug/l	SW846 6010D
Selenium	16.5	10		ug/l	SW846 6010D
Thallium	15.5	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	1.9	0.25		mg/l	EPA 365.3
Sulfate	313	2.0		mg/l	EPA 300/SW846 9056A

### JD52888-9F SOIL MW-609D 18-23' GW MW-609D T3 DAY 14

Arsenic	68900	60		ug/l	SW846 6010D
Iron	137	100		ug/l	SW846 6010D
Nickel	30.3	10		ug/l	SW846 6010D
Thallium	46.9	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	2.0	0.25		mg/l	EPA 365.3
Sulfate	1310	12		mg/l	EPA 300/SW846 9056A

Summary of Hits

Job Number: JD52888  
Account: Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA  
Collected: 09/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD52888-10F      SOIL MW-609D 18-23' GW MW-609D T3-DUP DAY 14

Arsenic	71700	60	ug/l	SW846 6010D
Iron	147	100	ug/l	SW846 6010D
Nickel	21.3	10	ug/l	SW846 6010D
Thallium	48.2	10	ug/l	SW846 6010D
Phosphate, Ortho <sup>b</sup>	2.4	0.25	mg/l	EPA 365.3
Sulfate	1320	14	mg/l	EPA 300/SW846 9056A

- (a) Elevated detection limit due to dilution required for high interfering element.  
(b) Lab filtration performed out of hold time.

## Sample Results

## Report of Analysis

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3 DAY 14**Lab Sample ID:** JD52888-1F**Date Sampled:** 09/30/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Arsenic	1730	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Copper	35.1	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Iron	< 100	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Lead	3.4	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup> SW846 7470A <sup>4</sup>
Nickel	110	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Selenium	34.5	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Thallium	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D T3 DAY 14	<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-1F	<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	1	10/01/22 10:00	JOO	EPA 365.3

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 14**Lab Sample ID:** JD52888-2F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/30/22**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Arsenic	1650	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Copper	41.7	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Iron	< 100	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Lead	4.5	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup> SW846 7470A <sup>4</sup>
Nickel	90.1	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Selenium	34.9	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Thallium	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Zinc	40.6	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 14			<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-2F			<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	242	2.0	mg/l	1	10/12/22 01:57	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S T3 DAY 14**Lab Sample ID:** JD52888-3F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/30/22**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Arsenic <sup>a</sup>	277	30	ug/l	10	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Copper	19.8	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron	203	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	16.2	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Selenium <sup>a</sup>	157	100	ug/l	10	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3 DAY 14	<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-3F	<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	< 0.10	0.10	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	1870	18	mg/l	9	10/12/22 18:05	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3-DUP DAY 14		
<b>Lab Sample ID:</b>	JD52888-4F	<b>Date Sampled:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Date Received:</b>	09/30/22
		<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	2	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Arsenic	660	15	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cadmium	< 15	15	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cobalt	< 250	250	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Copper	< 50	50	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron	< 500	500	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Lead <sup>a</sup>	< 30	30	ug/l	2	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Manganese	< 75	75	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/11/22	10/12/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 50	50	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Selenium <sup>a</sup>	128	100	ug/l	2	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Silver	< 50	50	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	2	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Zinc	< 100	100	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53134

(2) Instrument QC Batch: MA53152

(3) Prep QC Batch: MP35669

(4) Prep QC Batch: MP35690

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3-DUP DAY 14			<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-4F			<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	0.11	0.10	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
	1840	18	mg/l	9	10/12/22 18:18	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 25-33' GW MW-608D T3 DAY 14**Lab Sample ID:** JD52888-5F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/30/22**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	212	120	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Arsenic	92500	60	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cadmium <sup>a</sup>	70.4	60	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Copper	< 10	10	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron	303	100	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/11/22	10/12/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	21.9	10	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Zinc	23.2	20	ug/l	1	10/12/22	10/13/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53134

(2) Instrument QC Batch: MA53152

(3) Prep QC Batch: MP35669

(4) Prep QC Batch: MP35690

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D T3 DAY 14	<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-5F	<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	5.5	1.3	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	2730	26	mg/l	13	10/12/22 18:37	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D T3-DUP DAY 14		
<b>Lab Sample ID:</b>	JD52888-6F	<b>Date Sampled:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Date Received:</b>	09/30/22
		<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	173	120	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Arsenic	75100	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Copper	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron	295	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Lead <sup>a</sup>	62.0	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	26.3	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Silver <sup>a</sup>	< 200	200	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-608D T3-DUP DAY 14			<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-6F			<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	4.3	1.3	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	2700	24	mg/l	12	10/12/22 18:49	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 14**Lab Sample ID:** JD52888-7F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/30/22**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony	36.3	6.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Arsenic	20100	15	ug/l	5	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cadmium <sup>a</sup>	< 15	15	ug/l	5	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Copper	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Iron	342	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Lead	12.2	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	15.8	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Selenium	21.3	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Thallium	17.1	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Zinc	23.3	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 14	<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-7F	<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.7	0.25	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	210	2.0	mg/l	1	10/12/22 03:43	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3-DUP DAY 14		
<b>Lab Sample ID:</b>	JD52888-8F	<b>Date Sampled:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Date Received:</b>	09/30/22
<b>Project:</b>	SANHPAFW: Marcus Hook, PA	<b>Percent Solids:</b>	n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	23.0	6.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Arsenic	15600	15	ug/l	5	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cadmium <sup>a</sup>	< 15	15	ug/l	5	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Copper	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Iron	224	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Lead	8.9	3.0	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup> SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Selenium	16.5	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Thallium	15.5	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Prep QC Batch: MP35602

(4) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3-DUP DAY 14			<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-8F			<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.9	0.25	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	313	2.0	mg/l	1	10/12/22 03:59	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D T3 DAY 14**Lab Sample ID:** JD52888-9F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 09/30/22**Date Received:** 09/30/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Arsenic	68900	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	10/10/22	10/13/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	137	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	30.3	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	46.9	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Instrument QC Batch: MA53151

(4) Prep QC Batch: MP35602

(5) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3 DAY 14	<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-9F	<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	2.0	0.25	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
Sulfate	1310	12	mg/l	6	10/12/22 19:04	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D T3-DUP DAY 14  
**Lab Sample ID:** JD52888-10F  
**Matrix:** AQ - Groundwater Filtered  
**Project:** SANHPAFW: Marcus Hook, PA

**Date Sampled:** 09/30/22  
**Date Received:** 09/30/22  
**Percent Solids:** n/a

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Arsenic	71700	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	10/10/22	10/13/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>4</sup>
Cobalt	< 50	50	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Iron	147	100	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Manganese	< 15	15	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	< 0.20	0.20	ug/l	1	10/10/22	10/11/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>5</sup>
Nickel	21.3	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	< 10	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Thallium	48.2	10	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	< 20	20	ug/l	1	10/10/22	10/11/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA53127

(2) Instrument QC Batch: MA53137

(3) Instrument QC Batch: MA53151

(4) Prep QC Batch: MP35602

(5) Prep QC Batch: MP35648

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3-DUP DAY 14			<b>Date Sampled:</b>	09/30/22
<b>Lab Sample ID:</b>	JD52888-10F			<b>Date Received:</b>	09/30/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	2.4	0.25	mg/l	1	10/01/22 10:00	JOO	EPA 365.3
	1320	14	mg/l	7	10/12/22 19:46	SS	EPA 300/SW846 9056A

(a) Lab filtration performed out of hold time.

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody





## SGS Sample Receipt Summary

**Job Number:** JD52888

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 9/30/2022 4:45:00 PM

**Delivery Method:** \_\_\_\_\_

**Airbill #s:** \_\_\_\_\_

**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.9);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.5);

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun                              |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
Rev. Date 12/7/17

JD52888: Chain of Custody

Page 2 of 3

Job Change Order: JD52888

**Requested Date:** 10/17/2022      **Received Date:** 9/30/2022  
**Account Name:** Sunoco/Evergreen      **Due Date:** 10/17/2022  
**Project Description:** SANHPAFW: Marcus Hook, PA      **Deliverable:** COMMB  
**C/O Initiated By:** VICKYP      **PM:** VP      **TAT (Days):** 14

**Sample #:** JD52888-1F      **Change:**  
**Dept:** Please cancel SO4 analysis, no volume left

**TAT:** 14

SOIL MW-560 15-25' GW MW-560D T3 D

## Metals Analysis

5

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/10/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	9.2	150		
Antimony	6.0	2.8	4.7	1.5	<6.0
Arsenic	3.0	2.6	2.8	0.20	<3.0
Barium	200	.2	13		
Beryllium	1.0	.2	.5		
Bismuth	20	2.5	8.6		
Boron	100	1.8	10		
Cadmium	3.0	.4	1	0.0	<3.0
Calcium	5000	13	99		
Cerium	100				
Chromium	10	.7	2		
Cobalt	50	.6	2.6	-0.10	<50
Copper	10	.7	5.9	-1.0	<10
Iron	100	3.3	32	1.3	<100
Lead	3.0	2	1.8	1.4	<3.0
Lithium	50	1.5	7.3		
Magnesium	5000	25	140		
Manganese	15	.1	1.4	0.0	<15
Molybdenum	20	.6	3.6		
Nickel	10	.8	1.7	-0.50	<10
Phosphorus	50	7	18		
Potassium	10000	35	200		
Selenium	10	3.6	4.9	-1.2	<10
Silicon	200	2.2	32		
Silver	10	.6	6.1	1.6	<10
Sodium	10000	14	570		
Strontium	10	.1	2.7		
Sulfur	50	3.7	45		
Thallium	10	5.2	1.8	0.90	<10
Tin	10	1.4	3.7		
Titanium	10	.8	2.5		
Tungsten	50	1.3	40		
Vanadium	50	.5	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/10/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.3	6.9	1.3	<20
Zirconium	10	.5	4.1		

Associated samples MP35602: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F Original MS		Spikelet MPSPK2	% Rec	QC Limits
Aluminum					
Antimony	0.00	1930	2000	96.5	75-125
Arsenic	277	2220	2000	97.2	75-125
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	0.0	1980	2000	99.0	75-125
Cerium					
Chromium					
Cobalt	2.8	1930	2000	96.5	75-125
Copper	19.8	1960	2000	97.5	75-125
Iron	203	24500	25000	97.1	75-125
Lead	0.00	1940	2000	97.0	75-125
Lithium					
Magnesium					
Manganese	2.2	1880	2000	93.9	75-125
Molybdenum					
Nickel	16.2	1930	2000	95.8	75-125
Phosphorus					
Potassium					
Selenium	157	2070	2000	95.7	75-125
Silicon					
Silver	0.0	241	250	91.2	75-125
Strontium					
Thallium	0.00	1980	2000	99.0	75-125
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc	18.1	1870	2000	92.0	75-125
Zirconium					

Associated samples MP35602: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F	Spikelot	QC	
	Original MS	MPSPK2	% Rec	Limits

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.00	2100	2000	105.0	8.4	20
Arsenic	277	2410	2000	106.7	8.2	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium	0.0	1980	2000	99.0	2.0	20
Cerium						
Chromium						
Cobalt	2.8	1930	2000	96.5	0.0	20
Copper	19.8	1970	2000	98.0	1.5	20
Iron	203	24600	25000	97.5	5.1	20
Lead	0.00	2100	2000	105.0	7.9	20
Lithium						
Magnesium						
Manganese	2.2	1880	2000	93.9	6.7	20
Molybdenum						
Nickel	16.2	1920	2000	95.3	2.1	20
Phosphorus						
Potassium						
Selenium	157	2240	2000	104.2	7.9	20
Silicon						
Silver	0.0	239	250	90.4	2.5	20
Strontium						
Thallium	0.00	2110	2000	105.5	6.4	20
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	18.1	1870	2000	92.0	6.7	20
Zirconium						

Associated samples MP35602: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F Original MSD	Spielot MPSPK2	% Rec	MSD RPD	QC Limit
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Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52888

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 10/10/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony	1890	2000	94.5	80-120
Arsenic	1890	2000	94.5	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	1920	2000	96.0	80-120
Calcium				
Cerium				
Chromium				
Cobalt	1930	2000	96.5	80-120
Copper	1880	2000	94.0	80-120
Iron	24400	25000	97.6	80-120
Lead	1950	2000	97.5	80-120
Lithium				
Magnesium				
Manganese	1930	2000	96.5	80-120
Molybdenum				
Nickel	1930	2000	96.5	80-120
Phosphorus				
Potassium				
Selenium	1890	2000	94.5	80-120
Silicon				
Silver	232	250	92.8	80-120
Sodium				
Strontium				
Sulfur				
Thallium	1960	2000	98.0	80-120
Tin				
Titanium				
Tungsten				
Vanadium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc	1940	2000	97.0	80-120
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Zirconium

Associated samples MP35602: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony	0.00	0.00	NC	0-10
Arsenic	277	305	10.1 (a)	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	0.00	0.00	NC	0-10
Cerium				
Chromium				
Cobalt	2.80	0.00	NC	0-10
Copper	19.8	19.7	79.1 (a)	0-10
Iron	203	237	6.0	0-10
Lead	0.00	0.00	NC	0-10
Lithium				
Magnesium				
Manganese	2.20	2.80	7.7	0-10
Molybdenum				
Nickel	16.2	15.8	11.3 (a)	0-10
Phosphorus				
Potassium				
Selenium	157	237	51.1 (a)	0-10
Silicon				
Silver	0.00	0.00	NC (a)	0-10
Sodium				
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	18.1	28.4	6.3	0-10
Zirconium				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35602  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-3F	QC	
	Original SDL 1:5	%DIF	Limits

Associated samples MP35602: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35648  
Matrix Type: AQUEOUS

Methods: SW846 7470A  
Units: ug/l

Prep Date: 10/10/22

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.20	.034	.095	-0.038	<0.20

Associated samples MP35648: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

5.2.1

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35648  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-10F Original MS	Spikelot HGPW3	% Rec	QC Limits
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Mercury	0.0	1.4	2	70.0N(a)	75-125
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Associated samples MP35648: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35648  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/10/22

Metal	JD52888-10F Original MSD	Spikelot HGPW3	% Rec	MSD RPD	QC Limit
Mercury	0.0	1.4	2	70.0N(a) 0.0	20

Associated samples MP35648: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

### SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52888

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35648

Methods: SW846 7470A

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

10/10/22

Metal	BSP Result	Spikelot HGPW3	% Rec	QC Limits
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Mercury	2.0	2	100.0	80-120
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Associated samples MP35648: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/12/22 10/12/22

Metal	RL	IDL	MDL	MB raw	final	MB raw	final
Aluminum	200	17	150				
Antimony	6.0	1.7	4.7	0.20	<6.0	-0.80	<6.0
Arsenic	3.0	2.1	2.8	-0.10	<3.0	0.10	<3.0
Barium	200	.8	13				
Beryllium	1.0	.3	.5				
Bismuth	20	2.3	8.6				
Boron	100	2.3	10				
Cadmium	3.0	.3	1	-0.10	<3.0	-0.20	<3.0
Calcium	5000	6.6	99				
Cerium	100						
Chromium	10	.3	2				
Cobalt	50	.4	2.6	-0.10	<50	-0.20	<50
Copper	10	.8	5.9	0.30	<10	0.20	<10
Iron	100	5.3	32	-1.3	<100	-2.6	<100
Lead	3.0	1.1	1.8	-0.50	<3.0	0.60	<3.0
Lithium	50	4.8	7.3				
Magnesium	5000	32	140				
Manganese	15	.1	1.4	0.0	<15	-0.10	<15
Molybdenum	20	.6	3.6				
Nickel	10	.4	1.7	0.0	<10	0.0	<10
Phosphorus	50	1.2	18				
Potassium	10000	77	200				
Selenium	10	3.2	4.9	-1.3	<10	0.70	<10
Silicon	200	1.7	32				
Silver	10	1	6.1	0.80	<10	1.3	<10
Sodium	10000	34	570				
Strontium	10	.3	2.7				
Sulfur	50	3	45				
Thallium	10	1.8	1.8	-0.60	<10	-1.3	<10
Tin	10	.8	3.7				
Titanium	10	.5	2.5				
Tungsten	50	2.6	40				
Vanadium	50	.6	1.8				

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/12/22 10/12/22

Metal	RL	IDL	MDL	MB raw	final	MB raw	final
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Zinc	20	.1	6.9	-0.20	<20	0.80	<20
Zirconium	10	.3	4.1				

Associated samples MP35669: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F Original MS		Spikelot MPSPK2	% Rec	QC Limits
Aluminum					
Antimony	42.5	10500	10000	104.6	75-125
Arsenic	660	10900	10000	102.4	75-125
Barium	anr				
Beryllium					
Bismuth					
Boron					
Cadmium	1.5	10300	10000	103.0	75-125
Calcium					
Cerium					
Chromium	anr				
Cobalt	0.0	10100	10000	101.0	75-125
Copper	7.0	10200	10000	101.9	75-125
Iron	210	132000	125000	105.4	75-125
Lead	0.0	10200	10000	102.0	75-125
Lithium					
Magnesium					
Manganese	7.5	10200	10000	101.9	75-125
Molybdenum					
Nickel	10.0	10100	10000	100.9	75-125
Phosphorus					
Potassium					
Selenium	128	10600	10000	104.7	75-125
Silicon					
Silver	6.5	1250	1250	99.5	75-125
Sodium	anr				
Strontium					
Sulfur					
Thallium	0.0	10900	10000	109.0	75-125
Tin					
Titanium					
Tungsten					
Vanadium					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F Original MS	Spikelot MPSPK2	% Rec	QC Limits
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Zinc 12.0 10100 10000 100.9 75-125

Zirconium

Associated samples MP35669: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	42.5	10700	10000	106.6	0.0	20
Arsenic	660	11100	10000	104.4	0.9	20
Barium	anr					
Beryllium						
Bismuth						
Boron						
Cadmium	1.5	10400	10000	104.0	1.0	20
Calcium						
Cerium						
Chromium	anr					
Cobalt	0.0	10400	10000	104.0	1.0	20
Copper	7.0	10300	10000	102.9	1.0	20
Iron	210	140000	125000	111.8	3.0	20
Lead	0.0	10100	10000	101.0	1.0	20
Lithium						
Magnesium						
Manganese	7.5	10500	10000	104.9	0.0	20
Molybdenum						
Nickel	10.0	10300	10000	102.9	0.0	20
Phosphorus						
Potassium						
Selenium	128	10700	10000	105.7	0.0	20
Silicon						
Silver	6.5	1290	1250	102.7	0.8	20
Sodium	anr					
Strontium						
Sulfur						
Thallium	0.0	10500	10000	105.0	3.7	20
Tin						
Titanium						
Tungsten						
Vanadium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc	12.0	10200	10000	101.9	1.0	20
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Zirconium

Associated samples MP35669: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/12/22

10/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum								
Antimony	1980	2000	99.0	80-120	2000	2000	100.0	80-120
Arsenic	1940	2000	97.0	80-120	1960	2000	98.0	80-120
Barium	anr							
Beryllium								
Bismuth								
Boron								
Cadmium	1980	2000	99.0	80-120	2010	2000	100.5	80-120
Calcium								
Cerium								
Chromium	anr							
Cobalt	1960	2000	98.0	80-120	1990	2000	99.5	80-120
Copper	1990	2000	99.5	80-120	2020	2000	101.0	80-120
Iron	27000	25000	108.0	80-120	26700	25000	106.8	80-120
Lead	1960	2000	98.0	80-120	1990	2000	99.5	80-120
Lithium								
Magnesium								
Manganese	1990	2000	99.5	80-120	2030	2000	101.5	80-120
Molybdenum								
Nickel	1960	2000	98.0	80-120	1990	2000	99.5	80-120
Phosphorus								
Potassium								
Selenium	1970	2000	98.5	80-120	1970	2000	98.5	80-120
Silicon								
Silver	240	250	96.0	80-120	244	250	97.6	80-120
Sodium	anr							
Strontium								
Sulfur								
Thallium	2080	2000	104.0	80-120	2040	2000	102.0	80-120
Tin								
Titanium								
Tungsten								
Vanadium								

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22 10/12/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc	1960	2000	98.0	80-120	2100	2000	105.0	80-120
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Zirconium

Associated samples MP35669: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	8.50	0.00	100.0(a)	0-10
Arsenic	132	125	5.5	0-10
Barium	anr			
Beryllium				
Bismuth				
Boron				
Cadmium	0.300	0.00	100.0(a)	0-10
Calcium				
Cerium				
Chromium	anr			
Cobalt	0.00	0.00	NC	0-10
Copper	1.40	6.50	364.3(a)	0-10
Iron	42.0	296	604.8(a)	0-10
Lead	0.00	0.00	NC	0-10
Lithium				
Magnesium				
Manganese	1.50	12.2	713.3(a)	0-10
Molybdenum				
Nickel	2.00	6.30	215.0(a)	0-10
Phosphorus				
Potassium				
Selenium	25.6	0.00	100.0(a)	0-10
Silicon				
Silver	1.30	0.00	100.0(a)	0-10
Sodium	anr			
Strontium				
Sulfur				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35669  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/12/22

Metal	JD52888-4F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc 2.40 25.4 958.3(a) 0-10

Zirconium

Associated samples MP35669: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35690  
Matrix Type: AQUEOUS

Methods: SW846 7470A  
Units: ug/l

Prep Date: 10/11/22

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.20	.024	.095	-0.020	<0.20

Associated samples MP35690: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35690  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/11/22

Metal	JD52888-4F		SpikeLot		QC
	Original	MS	HGPW3	% Rec	Limits

Mercury	0.0	1.9	2	95.0	75-125
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Associated samples MP35690: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

# MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD52888  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35690  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/11/22

Metal	JD52888-4F Original MSD	Spikelot HGPW3	% Rec	MSD RPD	QC Limit	
Mercury	0.0	1.9	2	95.0	0.0	20

Associated samples MP35690: JD52888-4F, JD52888-5F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

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## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Fluoride	GP42791/GN34297	0.20	0.0	mg/l	2	2.19	109.5	90-110%
Phosphate, Ortho	GN33936	0.050	0.0	mg/l	0.2	0.19	95.0	90-110%
Sulfate	GP42791/GN34297	2.0	0.0	mg/l	80	80.2	100.3	90-110%

Associated Samples:  
Batch GN33936: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F  
Batch GP42791: JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Fluoride	GP42791/GN34297	JD53380-1	mg/l	0.71	0.71	0.0	0-20%
Phosphate, Ortho	GN33936	JD52888-1F	mg/l	0.067	0.067	0.0	0-23%
Sulfate	GP42791/GN34297	JD53380-1	mg/l	5.5	5.6	1.8	0-20%

Associated Samples:

Batch GN33936: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Batch GP42791: JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD52888  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Fluoride	GP42791/GN34297	JD53380-1	mg/l	0.71	2	2.9	109.5	80-120%
Phosphate, Ortho	GN33936	JD52888-1F	mg/l	0.067	0.4	0.50	108.3	25-150%
Sulfate	GP42791/GN34297	JD53380-1	mg/l	5.5	80	85.1	99.5	80-120%

Associated Samples:

Batch GN33936: JD52888-1F, JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

Batch GP42791: JD52888-2F, JD52888-3F, JD52888-4F, JD52888-5F, JD52888-6F, JD52888-7F, JD52888-8F, JD52888-9F, JD52888-10F

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

***e-Hardcopy 2.0***  
***Automated Report***

## Technical Report for

Sunoco/Evergreen

SANHPAFW: Marcus Hook, PA

4862.04

SGS Job Number: JD53458

Sampling Date: 10/10/22



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Total number of pages in report: **354**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain  
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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## Sample Summary

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD53458-1F	10/10/22	08:00 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D C3 DAY 24
JD53458-2	10/10/22	08:10 MDL	10/11/22	SO	Soil	SOIL MW-560 15-25' GW MW-560D SOIL C3 DAY 24
JD53458-3F	10/10/22	08:15 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24
JD53458-4	10/10/22	08:25 MDL	10/11/22	SO	Soil	SOIL MW-560 15-25' GW MW-560D SOIL C3 DUP DAY 24
JD53458-5F	10/10/22	08:30 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3 DAY 24
JD53458-6	10/10/22	08:40 MDL	10/11/22	SO	Soil	SOIL MW-560 15-25' GW MW-560D SOIL T3 DAY 24
JD53458-7F	10/10/22	08:45 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 24
JD53458-8	10/10/22	08:55 MDL	10/11/22	SO	Soil	SOIL MW-560 15-25' GW MW-560D SOIL T3 DUP DAY 24
JD53458-9F	10/10/22	09:00 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S C3 DAY 24
JD53458-10	10/10/22	09:10 MDL	10/11/22	SO	Soil	SOIL MW-608D 10-15' GW MW-606S SOIL C3 DAY 24
JD53458-11F	10/10/22	09:15 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S C3 DUP DAY 24
JD53458-12	10/10/22	09:25 MDL	10/11/22	SO	Soil	SOIL MW-608D 10-15' GW MW-606S SOIL C3 DUP DAY 24
JD53458-13F	10/10/22	09:30 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3 DAY 24

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD53458-14	10/10/22	09:40	MDL	10/11/22	SO Soil	SOIL MW-608D 10-15' GW MW-606S SOIL T3 DAY 24
JD53458-15F	10/10/22	09:45	MDL	10/11/22	AQ Groundwater Filtered	SOIL MW-608D 10-15' GW MW-606S T3 DUP DAY 24
JD53458-16	10/10/22	09:55	MDL	10/11/22	SO Soil	SOIL MW-608D 10-15' GW MW-606S SOIL T3 DUP DAY 24
JD53458-17F	10/10/22	10:00	MDL	10/11/22	AQ Groundwater Filtered	SOIL MW-608D 25-33' GW MW-606D C3 DAY 24
JD53458-18	10/10/22	10:10	MDL	10/11/22	SO Soil	SOIL MW-608D 25-33' GW MW-606D SOIL C3 DAY 24
JD53458-19F	10/10/22	10:15	MDL	10/11/22	AQ Groundwater Filtered	SOIL MW-608D 25-33' GW MW-606D C3 DUP DAY 24
JD53458-20	10/10/22	10:25	MDL	10/11/22	SO Soil	SOIL MW-608D 25-33' GW MW-606D SOIL C3 DUP DAY 24
JD53458-21F	10/10/22	10:30	MDL	10/11/22	AQ Groundwater Filtered	SOIL MW-608D 25-33' GW MW-606D T3 DAY 24
JD53458-22	10/10/22	10:40	MDL	10/11/22	SO Soil	SOIL MW-608D 25-33' GW MW-606D SOIL T3 DAY 24
JD53458-23F	10/10/22	10:45	MDL	10/11/22	AQ Groundwater Filtered	SOIL MW-608D 25-33' GW MW-606D T3 DUP DAY 24
JD53458-24	10/10/22	10:55	MDL	10/11/22	SO Soil	SOIL MW-608D 25-33' GW MW-606D SOIL T3 DUP DAY 24
JD53458-25F	10/10/22	11:00	MDL	10/11/22	AQ Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D C3 DAY 24
JD53458-26	10/10/22	11:10	MDL	10/11/22	SO Soil	SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DAY 24

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD53458-27F	10/10/22	11:15 MDL	10/11/22	AQ	Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D C3 DUP DAY 24
JD53458-28	10/10/22	11:25 MDL	10/11/22	SO	Soil	SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DUP DAY 24
JD53458-29F	10/10/22	11:30 MDL	10/11/22	AQ	Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 24
JD53458-30	10/10/22	11:40 MDL	10/11/22	SO	Soil	SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DAY 24
JD53458-31F	10/10/22	11:45 MDL	10/11/22	AQ	Groundwater Filtered	SOIL AO17 BH22 20-28' GW MW-56D T3 DUP DAY 24
JD53458-32	10/10/22	11:55 MDL	10/11/22	SO	Soil	SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DUP DAY 24
JD53458-33F	10/10/22	14:00 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D C3 DAY 24
JD53458-34	10/10/22	14:10 MDL	10/11/22	SO	Soil	SOIL MW-609D 18-23' GW MW-609D SOIL C3 DAY 24
JD53458-35F	10/10/22	14:15 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D C3 DUP DAY 24
JD53458-36	10/10/22	14:25 MDL	10/11/22	SO	Soil	SOIL MW-609D 18-23' GW MW-609D SOIL C3 DUP DAY 24
JD53458-37F	10/10/22	14:30 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3 DAY 24
JD53458-38	10/10/22	14:40 MDL	10/11/22	SO	Soil	SOIL MW-609D 18-23' GW MW-609D SOIL T3 DAY 24
JD53458-39F	10/10/22	14:45 MDL	10/11/22	AQ	Groundwater Filtered	SOIL MW-609D 18-23' GW MW-609D T3 DUP DAY 24

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary  
(continued)

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD53458-40	10/10/22	14:55	MDL	10/11/22	SO Soil	SOIL MW-609D 18-23' GW MW-609D SOIL T3 DUP DAY 24

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

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**Client:** Sunoco/Evergreen

**Job No** JD53458

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 10/27/2022 2:58:38 P

On 10/11/2022, 40 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.6 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD53458 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP35770

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53407-2FMS, JD53407-2FMSD, JD53407-2FSDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Arsenic, Cadmium, Cobalt, Copper, Iron, Nickel are outside control limits for sample MP35770-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- JD53458-23F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-21F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-21F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-23F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-25F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-23F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-19F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-25F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-25F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-19F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-19F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-33F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-19F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-25F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-33F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-21F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-19F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-27F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-27F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-5F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-27F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-17F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-21F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-15F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-21F for Selenium: Elevated detection limit due to dilution required for high interfering element.

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## Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP35770

- JD53458-27F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-27F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-17F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-29F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-25F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-31F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-33F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-33F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-23F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-33F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-29F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-11F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-1F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-7F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-9F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-9F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-23F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-9F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-9F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-3F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-11F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-11F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-11F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-13F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-15F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-17F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-17F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-15F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-13F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-15F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-13F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-13F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-17F for Antimony: Elevated detection limit due to dilution required for high interfering element.

**Matrix:** AQ

**Batch ID:** MP35821

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53458-39FMSD, JD53458-39FPS, JD53458-39FSDL, JD53458-39FMS, JD53458-39FMSD were used as the QC samples for metals.
- Matrix Spike /Matrix Spike Duplicate Recovery(s) for Selenium are outside control limits. Spike recovery indicates possible matrix interference.
- Matrix Spike /Matrix Spike Duplicate Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

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## Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP35821

- RPD(s) for Serial Dilution for Antimony, Cadmium, Copper, Iron, Silver, Zinc are outside control limits for sample MP35821-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- JD53458-35F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-37F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-35F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-35F for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-37F for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-37F for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-35F for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-35F for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-37F for Lead: Elevated detection limit due to dilution required for high interfering element.
- MP35821-SD1 for Manganese: Serial dilution indicates possible matrix interference.

**Matrix:** SO

**Batch ID:** MP35862

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53458-2MS, JD53458-2MSD, JD53458-2PS, JD53458-2SDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Antimony, Lead are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Arsenic (MSD only), Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for Serial Dilution for Antimony, Silver, Thallium are outside control limits for sample MP35862-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- JD53458-12 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-16 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-24 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Manganese: Elevated detection limit due to dilution required for high interfering element.

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## Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP35862

- JD53458-4 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-14 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-30 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-6 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-2 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-4 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-6 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-26 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-30 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-30 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-10 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-16 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-16 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-28 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-30 for Selenium: Elevated detection limit due to dilution required for high interfering element.

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## Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP35862

- JD53458-28 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-8 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-12 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Antimony: Elevated detection limit due to dilution required for high interfering element.
- JD53458-26 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-36 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-38 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD53458-34 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JD53458-40 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-26 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-16 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-20 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-16 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Selenium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Silver: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Cadmium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-18 for Thallium: Elevated detection limit due to dilution required for high interfering element.
- JD53458-30 for Manganese: Elevated detection limit due to dilution required for high interfering element.
- JD53458-20 for Copper: Elevated detection limit due to dilution required for high interfering element.
- JD53458-32 for Thallium: Elevated detection limit due to dilution required for high interfering element.

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**Batch ID:** MP35862

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## Metals Analysis By Method SW846 6010D

**Matrix:** SO

**Batch ID:** MP35862

- JD53458-26 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

## Metals Analysis By Method SW846 7470A

**Matrix:** AQ

**Batch ID:** MP35746

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53458-1FMSD, JD53458-1FMS were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Mercury are outside control limits. Spike recovery indicates possible matrix interference.
- Matrix Spike Duplicate Recovery(s) for Mercury are outside control limits. Spike recovery indicates possible matrix interference.

## Metals Analysis By Method SW846 7471B

**Matrix:** SO

**Batch ID:** MP35807

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53458-2MSD, JD53458-2MS were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Mercury are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MSD for Mercury are outside control limits for sample MP35807-S2. High rpd due to possible sample nonhomogeneity.

## General Chemistry By Method EPA 300/SW846 9056A

**Matrix:** AQ

**Batch ID:** GP42917

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53701-1DUP, JD53701-1MS were used as the QC samples for Sulfate.

**Matrix:** AQ

**Batch ID:** GP42918

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53701-2DUP, JD53701-2MS were used as the QC samples for Sulfate.

## General Chemistry By Method EPA 365.3

**Matrix:** AQ

**Batch ID:** GN34377

- All method blanks for this batch meet method specific criteria.
- Sample(s) JD53458-1FDUP, JD53458-1FMS were used as the QC samples for Phosphate, Ortho.
- The following samples were run outside of holding time for method EPA 365.3: JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-1F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F  
Analysis done out of holding time.

## General Chemistry By Method SM2540 G 18TH ED MOD

**Matrix:** SO

**Batch ID:** GN34531

- Sample(s) JD53458-2DUP were used as the QC samples for Solids, Percent.
- RPD(s) for Duplicate for Solids, Percent are outside control limits for sample GN34531-D1. High RPD due to nature of sample matrix.

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SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD53458-1F SOIL MW-560 15-25' GW MW-560D C3 DAY 24

Arsenic	1080	3.0		ug/l	SW846 6010D
Iron	1800	100		ug/l	SW846 6010D
Manganese	4260	15		ug/l	SW846 6010D
Nickel	14.2	10		ug/l	SW846 6010D
Zinc	131	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	0.33	0.10		mg/l	EPA 365.3
Sulfate	831	8.0		mg/l	EPA 300/SW846 9056A

### JD53458-2 SOIL MW-560 15-25' GW MW-560D SOIL C3 DAY 24

Antimony	4.2	3.3		mg/kg	SW846 6010D
Arsenic	1380	6.6		mg/kg	SW846 6010D
Cobalt	10.9	8.2		mg/kg	SW846 6010D
Copper	66.9	4.1		mg/kg	SW846 6010D
Iron	21800	82		mg/kg	SW846 6010D
Lead	582	3.3		mg/kg	SW846 6010D
Manganese	539	2.5		mg/kg	SW846 6010D
Mercury	2.3	0.20		mg/kg	SW846 7471B
Nickel	20.0	6.6		mg/kg	SW846 6010D
Selenium	8.8	3.3		mg/kg	SW846 6010D
Silver	1.5	0.82		mg/kg	SW846 6010D
Zinc	190	8.2		mg/kg	SW846 6010D

### JD53458-3F SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24

Arsenic	1510	3.0		ug/l	SW846 6010D
Iron	2840	100		ug/l	SW846 6010D
Manganese	5340	15		ug/l	SW846 6010D
Nickel	14.3	10		ug/l	SW846 6010D
Zinc	124	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	0.38	0.10		mg/l	EPA 365.3
Sulfate	864	8.0		mg/l	EPA 300/SW846 9056A

### JD53458-4 SOIL MW-560 15-25' GW MW-560D SOIL C3 DUP DAY 24

Arsenic <sup>b</sup>	2040	12		mg/kg	SW846 6010D
Cobalt	13.5	5.8		mg/kg	SW846 6010D
Copper <sup>b</sup>	135	14		mg/kg	SW846 6010D
Iron	27200	290		mg/kg	SW846 6010D
Lead <sup>b</sup>	1020	12		mg/kg	SW846 6010D
Manganese <sup>b</sup>	646	8.7		mg/kg	SW846 6010D
Mercury	18.8	2.8		mg/kg	SW846 7471B
Nickel	26.1	4.6		mg/kg	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Selenium <sup>b</sup>		14.6	12		mg/kg	SW846 6010D
Zinc		259	5.8		mg/kg	SW846 6010D

### JD53458-5F SOIL MW-560 15-25' GW MW-560D T3 DAY 24

Arsenic		7290	3.0		ug/l	SW846 6010D
Copper		17.0	10		ug/l	SW846 6010D
Nickel		101	10		ug/l	SW846 6010D
Selenium		14.0	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		0.55	0.10		mg/l	EPA 365.3
Sulfate		330	2.0		mg/l	EPA 300/SW846 9056A

### JD53458-6 SOIL MW-560 15-25' GW MW-560D SOIL T3 DAY 24

Arsenic <sup>b</sup>		1590	12		mg/kg	SW846 6010D
Cobalt		12.3	6.1		mg/kg	SW846 6010D
Copper		48.7	3.0		mg/kg	SW846 6010D
Iron		22700	61		mg/kg	SW846 6010D
Lead		251	2.4		mg/kg	SW846 6010D
Manganese		545	1.8		mg/kg	SW846 6010D
Mercury		2.6	0.26		mg/kg	SW846 7471B
Nickel		23.7	4.9		mg/kg	SW846 6010D
Selenium		3.5	2.4		mg/kg	SW846 6010D
Silver		1.6	0.61		mg/kg	SW846 6010D
Zinc		242	6.1		mg/kg	SW846 6010D

### JD53458-7F SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 24

Antimony <sup>b</sup>		13.3	12		ug/l	SW846 6010D
Arsenic		7720	3.0		ug/l	SW846 6010D
Cadmium		14.5	3.0		ug/l	SW846 6010D
Copper		31.1	10		ug/l	SW846 6010D
Nickel		114	10		ug/l	SW846 6010D
Selenium		26.6	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		0.56	0.10		mg/l	EPA 365.3
Sulfate		444	4.0		mg/l	EPA 300/SW846 9056A

### JD53458-8 SOIL MW-560 15-25' GW MW-560D SOIL T3 DUP DAY 24

Arsenic <sup>b</sup>		1360	13		mg/kg	SW846 6010D
Cobalt		14.5	6.7		mg/kg	SW846 6010D
Copper <sup>b</sup>		56.0	17		mg/kg	SW846 6010D
Iron		30300	340		mg/kg	SW846 6010D
Lead <sup>b</sup>		385	13		mg/kg	SW846 6010D
Manganese <sup>b</sup>		854	10		mg/kg	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Mercury		3.6	0.26		mg/kg	SW846 7471B
Nickel		27.5	5.4		mg/kg	SW846 6010D
Zinc		212	6.7		mg/kg	SW846 6010D

### JD53458-9F SOIL MW-608D 10-15' GW MW-606S C3 DAY 24

Arsenic	443	3.0		ug/l	SW846 6010D
Cadmium	3.7	3.0		ug/l	SW846 6010D
Iron	40300	100		ug/l	SW846 6010D
Manganese	3590	15		ug/l	SW846 6010D
Nickel	43.3	10		ug/l	SW846 6010D
Zinc	126	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	1.1	0.25		mg/l	EPA 365.3
Sulfate	3090	30		mg/l	EPA 300/SW846 9056A

### JD53458-10 SOIL MW-608D 10-15' GW MW-606S SOIL C3 DAY 24

Arsenic <sup>b</sup>	79.9	3.6		mg/kg	SW846 6010D
Cadmium <sup>b</sup>	1.1	0.89		mg/kg	SW846 6010D
Cobalt	15.6	4.5		mg/kg	SW846 6010D
Copper <sup>b</sup>	123	4.5		mg/kg	SW846 6010D
Iron	25500	89		mg/kg	SW846 6010D
Lead <sup>b</sup>	465	3.6		mg/kg	SW846 6010D
Manganese <sup>b</sup>	114	2.7		mg/kg	SW846 6010D
Mercury	10.5	2.0		mg/kg	SW846 7471B
Nickel	13.1	3.6		mg/kg	SW846 6010D
Selenium <sup>b</sup>	34.6	3.6		mg/kg	SW846 6010D
Silver <sup>b</sup>	1.4	0.89		mg/kg	SW846 6010D
Zinc	203	4.5		mg/kg	SW846 6010D

### JD53458-11F SOIL MW-608D 10-15' GW MW-606S C3 DUP DAY 24

Arsenic	291	3.0		ug/l	SW846 6010D
Cadmium	3.4	3.0		ug/l	SW846 6010D
Iron	27100	100		ug/l	SW846 6010D
Manganese	3600	15		ug/l	SW846 6010D
Nickel	47.5	10		ug/l	SW846 6010D
Zinc	248	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	0.29	0.10		mg/l	EPA 365.3
Sulfate	3060	30		mg/l	EPA 300/SW846 9056A

### JD53458-12 SOIL MW-608D 10-15' GW MW-606S SOIL C3 DUP DAY 24

Arsenic <sup>b</sup>	144	9.4		mg/kg	SW846 6010D
Cobalt	29.5	4.7		mg/kg	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Copper <sup>b</sup>		197	12		mg/kg	SW846 6010D
Iron		39600	240		mg/kg	SW846 6010D
Lead <sup>b</sup>		565	9.4		mg/kg	SW846 6010D
Manganese <sup>b</sup>		124	7.1		mg/kg	SW846 6010D
Mercury		11.6	2.3		mg/kg	SW846 7471B
Nickel		13.4	3.8		mg/kg	SW846 6010D
Selenium <sup>b</sup>		51.9	9.4		mg/kg	SW846 6010D
Zinc		414	4.7		mg/kg	SW846 6010D

### JD53458-13F SOIL MW-608D 10-15' GW MW-606S T3 DAY 24

Arsenic	330	3.0		ug/l	SW846 6010D
Iron	119	100		ug/l	SW846 6010D
Selenium <sup>b</sup>	105	100		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	0.15	0.10		mg/l	EPA 365.3
Sulfate	1620	16		mg/l	EPA 300/SW846 9056A

### JD53458-14 SOIL MW-608D 10-15' GW MW-606S SOIL T3 DAY 24

Arsenic <sup>b</sup>	111	9.8		mg/kg	SW846 6010D
Cobalt	24.3	4.9		mg/kg	SW846 6010D
Copper <sup>b</sup>	159	12		mg/kg	SW846 6010D
Iron	35500	250		mg/kg	SW846 6010D
Lead <sup>b</sup>	428	9.8		mg/kg	SW846 6010D
Manganese <sup>b</sup>	165	7.4		mg/kg	SW846 6010D
Mercury	8.9	1.8		mg/kg	SW846 7471B
Nickel	16.7	3.9		mg/kg	SW846 6010D
Selenium <sup>b</sup>	30.3	9.8		mg/kg	SW846 6010D
Zinc	311	4.9		mg/kg	SW846 6010D

### JD53458-15F SOIL MW-608D 10-15' GW MW-606S T3 DUP DAY 24

Arsenic	264	3.0		ug/l	SW846 6010D
Selenium <sup>b</sup>	82.1	50		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	0.22	0.10		mg/l	EPA 365.3
Sulfate	1380	14		mg/l	EPA 300/SW846 9056A

### JD53458-16 SOIL MW-608D 10-15' GW MW-606S SOIL T3 DUP DAY 24

Arsenic <sup>b</sup>	143	10		mg/kg	SW846 6010D
Cobalt	30.1	5.0		mg/kg	SW846 6010D
Copper <sup>b</sup>	207	13		mg/kg	SW846 6010D
Iron	41500	250		mg/kg	SW846 6010D
Lead <sup>b</sup>	579	10		mg/kg	SW846 6010D
Manganese <sup>b</sup>	130	7.6		mg/kg	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Mercury		11.5	2.4		mg/kg	SW846 7471B
Nickel		14.4	4.0		mg/kg	SW846 6010D
Selenium <sup>b</sup>		41.0	10		mg/kg	SW846 6010D
Zinc		397	5.0		mg/kg	SW846 6010D

### JD53458-17F SOIL MW-608D 25-33' GW MW-606D C3 DAY 24

Arsenic		378000	300		ug/l	SW846 6010D
Iron		2190	100		ug/l	SW846 6010D
Lead <sup>b</sup>		40.8	30		ug/l	SW846 6010D
Manganese		884	15		ug/l	SW846 6010D
Nickel		36.2	10		ug/l	SW846 6010D
Zinc		38.8	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		23.9	2.5		mg/l	EPA 365.3
Sulfate		2410	22		mg/l	EPA 300/SW846 9056A

### JD53458-18 SOIL MW-608D 25-33' GW MW-606D SOIL C3 DAY 24

Antimony <sup>b</sup>		52.7	11		mg/kg	SW846 6010D
Arsenic		10000	55		mg/kg	SW846 6010D
Cobalt		26.5	5.5		mg/kg	SW846 6010D
Copper <sup>b</sup>		305	14		mg/kg	SW846 6010D
Iron		32900	270		mg/kg	SW846 6010D
Lead		6230	55		mg/kg	SW846 6010D
Manganese <sup>b</sup>		217	8.2		mg/kg	SW846 6010D
Mercury		58.7	2.5		mg/kg	SW846 7471B
Nickel		22.2	4.4		mg/kg	SW846 6010D
Selenium <sup>b</sup>		116	11		mg/kg	SW846 6010D
Silver <sup>b</sup>		5.3	2.7		mg/kg	SW846 6010D
Zinc		662	5.5		mg/kg	SW846 6010D

### JD53458-19F SOIL MW-608D 25-33' GW MW-606D C3 DUP DAY 24

Arsenic		328000	300		ug/l	SW846 6010D
Iron		4880	100		ug/l	SW846 6010D
Manganese		968	15		ug/l	SW846 6010D
Nickel		31.2	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		21.8	2.5		mg/l	EPA 365.3
Sulfate		2390	24		mg/l	EPA 300/SW846 9056A

### JD53458-20 SOIL MW-608D 25-33' GW MW-606D SOIL C3 DUP DAY 24

Antimony <sup>b</sup>		47.2	11		mg/kg	SW846 6010D
Arsenic		10300	53		mg/kg	SW846 6010D
Cadmium <sup>b</sup>		15.0	13		mg/kg	SW846 6010D



## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Cobalt		53.6	5.3		mg/kg	SW846 6010D
Copper <sup>b</sup>		268	13		mg/kg	SW846 6010D
Iron		55300	260		mg/kg	SW846 6010D
Lead		5140	53		mg/kg	SW846 6010D
Manganese <sup>b</sup>		164	7.9		mg/kg	SW846 6010D
Mercury		68.8	8.6		mg/kg	SW846 7471B
Nickel		21.4	4.2		mg/kg	SW846 6010D
Selenium <sup>b</sup>		187	11		mg/kg	SW846 6010D
Silver <sup>b</sup>		7.9	2.6		mg/kg	SW846 6010D
Zinc <sup>b</sup>		1130	26		mg/kg	SW846 6010D

### JD53458-21F SOIL MW-608D 25-33' GW MW-606D T3 DAY 24

Antimony <sup>b</sup>	214	120		ug/l	SW846 6010D
Arsenic	101000	60		ug/l	SW846 6010D
Iron	181	100		ug/l	SW846 6010D
Manganese	119	15		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	12.8	2.5		mg/l	EPA 365.3
Sulfate	3190	30		mg/l	EPA 300/SW846 9056A

### JD53458-22 SOIL MW-608D 25-33' GW MW-606D SOIL T3 DAY 24

Antimony	58.4	11		mg/kg	SW846 6010D
Arsenic	9510	55		mg/kg	SW846 6010D
Cobalt	42.4	5.5		mg/kg	SW846 6010D
Copper	327	14		mg/kg	SW846 6010D
Iron	47800	280		mg/kg	SW846 6010D
Lead	7490	55		mg/kg	SW846 6010D
Manganese	205	8.3		mg/kg	SW846 6010D
Mercury	55.6	8.6		mg/kg	SW846 7471B
Nickel	24.1	4.4		mg/kg	SW846 6010D
Selenium	580	11		mg/kg	SW846 6010D
Silver	10.0	2.8		mg/kg	SW846 6010D
Zinc	1000	28		mg/kg	SW846 6010D

### JD53458-23F SOIL MW-608D 25-33' GW MW-606D T3 DUP DAY 24

Antimony <sup>b</sup>	315	120		ug/l	SW846 6010D
Arsenic	111000	60		ug/l	SW846 6010D
Iron	237	100		ug/l	SW846 6010D
Manganese	111	15		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	12.4	2.5		mg/l	EPA 365.3
Sulfate	3250	32		mg/l	EPA 300/SW846 9056A

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD53458-24 SOIL MW-608D 25-33' GW MW-606D SOIL T3 DUP DAY 24

Antimony	39.6	11		mg/kg	SW846 6010D
Arsenic	9590	55		mg/kg	SW846 6010D
Cobalt	27.8	5.5		mg/kg	SW846 6010D
Copper	317	14		mg/kg	SW846 6010D
Iron	35400	270		mg/kg	SW846 6010D
Lead	5790	55		mg/kg	SW846 6010D
Manganese	248	8.2		mg/kg	SW846 6010D
Mercury	54.8	2.7		mg/kg	SW846 7471B
Nickel	22.1	4.4		mg/kg	SW846 6010D
Selenium	113	11		mg/kg	SW846 6010D
Silver	5.3	2.7		mg/kg	SW846 6010D
Zinc	617	5.5		mg/kg	SW846 6010D

### JD53458-25F SOIL AO17 BH22 20-28' GW MW-56D C3 DAY 24

Arsenic	63300	30		ug/l	SW846 6010D
Iron	26000	100		ug/l	SW846 6010D
Lead <sup>b</sup>	30.3	30		ug/l	SW846 6010D
Manganese	6090	15		ug/l	SW846 6010D
Nickel	43.0	10		ug/l	SW846 6010D
Zinc	181	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	1.5	0.50		mg/l	EPA 365.3
Sulfate	866	8.0		mg/l	EPA 300/SW846 9056A

### JD53458-26 SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DAY 24

Arsenic <sup>b</sup>	2620	12		mg/kg	SW846 6010D
Cadmium <sup>b</sup>	3.4	2.9		mg/kg	SW846 6010D
Cobalt	11.8	5.8		mg/kg	SW846 6010D
Copper <sup>b</sup>	175	14		mg/kg	SW846 6010D
Iron	26900	290		mg/kg	SW846 6010D
Lead <sup>b</sup>	1330	12		mg/kg	SW846 6010D
Manganese <sup>b</sup>	304	8.7		mg/kg	SW846 6010D
Mercury	12.0	2.2		mg/kg	SW846 7471B
Nickel	22.6	4.6		mg/kg	SW846 6010D
Selenium <sup>b</sup>	22.9	12		mg/kg	SW846 6010D
Zinc	356	5.8		mg/kg	SW846 6010D

### JD53458-27F SOIL AO17 BH22 20-28' GW MW-56D C3 DUP DAY 24

Arsenic	77200	30		ug/l	SW846 6010D
Iron	12000	100		ug/l	SW846 6010D
Manganese	3220	15		ug/l	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Nickel		29.5	10		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		2.0	0.50		mg/l	EPA 365.3
Sulfate		2220	22		mg/l	EPA 300/SW846 9056A

### JD53458-28 SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DUP DAY 24

Antimony <sup>b</sup>		29.1	11		mg/kg	SW846 6010D
Arsenic		5460	21		mg/kg	SW846 6010D
Cadmium <sup>b</sup>		7.5	5.3		mg/kg	SW846 6010D
Cobalt		24.2	5.3		mg/kg	SW846 6010D
Copper <sup>b</sup>		240	13		mg/kg	SW846 6010D
Iron		33000	270		mg/kg	SW846 6010D
Lead <sup>b</sup>		3580	11		mg/kg	SW846 6010D
Manganese <sup>b</sup>		243	8.0		mg/kg	SW846 6010D
Mercury		43.8	2.3		mg/kg	SW846 7471B
Nickel		23.7	4.2		mg/kg	SW846 6010D
Selenium <sup>b</sup>		65.8	11		mg/kg	SW846 6010D
Silver <sup>b</sup>		3.3	2.7		mg/kg	SW846 6010D
Zinc		617	5.3		mg/kg	SW846 6010D

### JD53458-29F SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 24

Arsenic		46500	30		ug/l	SW846 6010D
Iron		154	100		ug/l	SW846 6010D
Lead		4.2	3.0		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		5.6	1.3		mg/l	EPA 365.3
Sulfate		287	2.0		mg/l	EPA 300/SW846 9056A

### JD53458-30 SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DAY 24

Arsenic <sup>b</sup>		1430	10		mg/kg	SW846 6010D
Cadmium <sup>b</sup>		2.6	2.5		mg/kg	SW846 6010D
Cobalt		18.1	5.0		mg/kg	SW846 6010D
Copper <sup>b</sup>		163	12		mg/kg	SW846 6010D
Iron		31100	250		mg/kg	SW846 6010D
Lead <sup>b</sup>		801	10		mg/kg	SW846 6010D
Manganese <sup>b</sup>		404	7.5		mg/kg	SW846 6010D
Mercury		14.0	2.0		mg/kg	SW846 7471B
Nickel		18.4	4.0		mg/kg	SW846 6010D
Selenium <sup>b</sup>		29.3	10		mg/kg	SW846 6010D
Zinc		409	5.0		mg/kg	SW846 6010D

### JD53458-31F SOIL AO17 BH22 20-28' GW MW-56D T3 DUP DAY 24

Antimony		60.6	6.0		ug/l	SW846 6010D
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## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Arsenic		49000	30		ug/l	SW846 6010D
Iron		356	100		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		5.4	1.3		mg/l	EPA 365.3
Sulfate		156	2.0		mg/l	EPA 300/SW846 9056A

### JD53458-32 SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DUP DAY 24

Arsenic <sup>b</sup>		3200	11		mg/kg	SW846 6010D
Cadmium <sup>b</sup>		4.2	2.8		mg/kg	SW846 6010D
Cobalt		13.7	5.7		mg/kg	SW846 6010D
Copper <sup>b</sup>		219	14		mg/kg	SW846 6010D
Iron		28700	280		mg/kg	SW846 6010D
Lead <sup>b</sup>		1340	11		mg/kg	SW846 6010D
Manganese <sup>b</sup>		524	8.5		mg/kg	SW846 6010D
Mercury		18.0	2.8		mg/kg	SW846 7471B
Nickel		23.4	4.5		mg/kg	SW846 6010D
Selenium <sup>b</sup>		22.5	11		mg/kg	SW846 6010D
Zinc		412	5.7		mg/kg	SW846 6010D

### JD53458-33F SOIL MW-609D 18-23' GW MW-609D C3 DAY 24

Arsenic		284000	300		ug/l	SW846 6010D
Iron		6710	100		ug/l	SW846 6010D
Manganese		2070	15		ug/l	SW846 6010D
Nickel		27.1	10		ug/l	SW846 6010D
Zinc		113	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		5.6	1.3		mg/l	EPA 365.3
Sulfate		2210	22		mg/l	EPA 300/SW846 9056A

### JD53458-34 SOIL MW-609D 18-23' GW MW-609D SOIL C3 DAY 24

Arsenic <sup>b</sup>		2820	12		mg/kg	SW846 6010D
Cobalt		13.6	6.1		mg/kg	SW846 6010D
Copper <sup>b</sup>		187	15		mg/kg	SW846 6010D
Iron		28700	300		mg/kg	SW846 6010D
Lead <sup>b</sup>		1470	12		mg/kg	SW846 6010D
Manganese <sup>b</sup>		306	9.1		mg/kg	SW846 6010D
Mercury		12.0	2.4		mg/kg	SW846 7471B
Nickel		21.2	4.9		mg/kg	SW846 6010D
Selenium <sup>b</sup>		25.9	12		mg/kg	SW846 6010D
Zinc		366	6.1		mg/kg	SW846 6010D

### JD53458-35F SOIL MW-609D 18-23' GW MW-609D C3 DUP DAY 24

Arsenic		172000	150		ug/l	SW846 6010D
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## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Cadmium <sup>b</sup>		187	150		ug/l	SW846 6010D
Iron		4270	100		ug/l	SW846 6010D
Manganese		1660	15		ug/l	SW846 6010D
Nickel		17.6	10		ug/l	SW846 6010D
Zinc		50.8	20		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>		4.8	1.3		mg/l	EPA 365.3
Sulfate		1970	22		mg/l	EPA 300/SW846 9056A

### JD53458-36 SOIL MW-609D 18-23' GW MW-609D SOIL C3 DUP DAY 24

Antimony <sup>b</sup>	29.2	11		mg/kg	SW846 6010D
Arsenic	4660	22		mg/kg	SW846 6010D
Cobalt	27.4	5.4		mg/kg	SW846 6010D
Copper <sup>b</sup>	269	14		mg/kg	SW846 6010D
Iron	38400	270		mg/kg	SW846 6010D
Lead <sup>b</sup>	3290	11		mg/kg	SW846 6010D
Manganese <sup>b</sup>	311	8.1		mg/kg	SW846 6010D
Mercury	27.6	2.7		mg/kg	SW846 7471B
Nickel	27.0	4.3		mg/kg	SW846 6010D
Selenium <sup>b</sup>	50.0	11		mg/kg	SW846 6010D
Zinc	807	5.4		mg/kg	SW846 6010D

### JD53458-37F SOIL MW-609D 18-23' GW MW-609D T3 DAY 24

Antimony <sup>b</sup>	96.6	60		ug/l	SW846 6010D
Arsenic	106000	150		ug/l	SW846 6010D
Manganese	23.8	15		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	6.3	1.3		mg/l	EPA 365.3
Sulfate	1020	10		mg/l	EPA 300/SW846 9056A

### JD53458-38 SOIL MW-609D 18-23' GW MW-609D SOIL T3 DAY 24

Antimony <sup>b</sup>	18.6	11		mg/kg	SW846 6010D
Arsenic <sup>b</sup>	3520	11		mg/kg	SW846 6010D
Cadmium <sup>b</sup>	3.4	2.7		mg/kg	SW846 6010D
Cobalt	24.2	5.3		mg/kg	SW846 6010D
Copper <sup>b</sup>	189	13		mg/kg	SW846 6010D
Iron	32800	270		mg/kg	SW846 6010D
Lead <sup>b</sup>	2440	11		mg/kg	SW846 6010D
Manganese <sup>b</sup>	210	8.0		mg/kg	SW846 6010D
Mercury	32.4	2.3		mg/kg	SW846 7471B
Nickel	22.1	4.3		mg/kg	SW846 6010D
Selenium <sup>b</sup>	40.3	11		mg/kg	SW846 6010D
Zinc	546	5.3		mg/kg	SW846 6010D

## Summary of Hits

**Job Number:** JD53458  
**Account:** Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Collected:** 10/10/22



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JD53458-39F SOIL MW-609D 18-23' GW MW-609D T3 DUP DAY 24

Antimony	87.2	60		ug/l	SW846 6010D
Arsenic	75300	30		ug/l	SW846 6010D
Cadmium	62.6	30		ug/l	SW846 6010D
Manganese	74.7	15		ug/l	SW846 6010D
Phosphate, Ortho <sup>a</sup>	8.2	1.3		mg/l	EPA 365.3
Sulfate	661	8.0		mg/l	EPA 300/SW846 9056A

### JD53458-40 SOIL MW-609D 18-23' GW MW-609D SOIL T3 DUP DAY 24

Antimony <sup>b</sup>	28.3	10		mg/kg	SW846 6010D
Arsenic	4860	20		mg/kg	SW846 6010D
Cobalt	31.4	5.1		mg/kg	SW846 6010D
Copper <sup>b</sup>	267	13		mg/kg	SW846 6010D
Iron	41800	260		mg/kg	SW846 6010D
Lead <sup>b</sup>	3580	10		mg/kg	SW846 6010D
Manganese <sup>b</sup>	255	7.7		mg/kg	SW846 6010D
Mercury	24.5	2.1		mg/kg	SW846 7471B
Nickel	26.5	4.1		mg/kg	SW846 6010D
Selenium <sup>b</sup>	62.9	10		mg/kg	SW846 6010D
Silver <sup>b</sup>	3.1	2.6		mg/kg	SW846 6010D
Zinc	814	5.1		mg/kg	SW846 6010D

(a) Analysis done out of holding time.

(b) Elevated detection limit due to dilution required for high interfering element.

Sample Results

Report of Analysis

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D C3 DAY 24**Lab Sample ID:** JD53458-1F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 30	30	ug/l	5	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	1080	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	1800	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	< 3.0	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Manganese	4260	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	14.2	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	131	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-1F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.33	0.10	mg/l	1	10/13/22 17:45	MP	EPA 365.3
Sulfate	831	8.0	mg/l	4	10/19/22 18:25	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D SOIL C3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-2			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	62.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	4.2	3.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Arsenic	1380	6.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 1.6	1.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	10.9	8.2	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper	66.9	4.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Iron	21800	82	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Lead	582	3.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Manganese	539	2.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Mercury	2.3	0.20	mg/kg	5	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	20.0	6.6	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium	8.8	3.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Silver	1.5	0.82	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Thallium	< 1.6	1.6	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Zinc	190	8.2	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24**Lab Sample ID:** JD53458-3F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 30	30	ug/l	5	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	1510	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	2840	100	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	< 3.0	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Manganese	5340	15	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	14.3	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	124	20	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-3F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.38	0.10	mg/l	1	10/13/22 17:45	MP	EPA 365.3
Sulfate	864	8.0	mg/l	4	10/19/22 18:38	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D SOIL C3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-4	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	56.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 12	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	2040	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 2.9	2.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	13.5	5.8	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	135	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	27200	290	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	1020	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	646	8.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	18.8	2.8	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	26.1	4.6	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	14.6	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.9	2.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.8	5.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	259	5.8	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3 DAY 24**Lab Sample ID:** JD53458-5F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 12	12	ug/l	2	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	7290	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	17.0	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	< 100	100	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	< 3.0	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	101	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	14.0	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-5F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.55	0.10	mg/l	1	10/13/22 17:45	MP	EPA 365.3
Sulfate	330	2.0	mg/l	1	10/18/22 17:39	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SOIL MW-560 15-25' GW MW-560D SOIL T3 DAY 24			Date Sampled:	10/10/22
Lab Sample ID:	JD53458-6			Date Received:	10/11/22
Matrix:	SO - Soil			Percent Solids:	53.3
Project:	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	1590	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 3.0	3.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	12.3	6.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper	48.7	3.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Iron	22700	61	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Lead	251	2.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Manganese	545	1.8	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Mercury	2.6	0.26	mg/kg	5	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	23.7	4.9	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium	3.5	2.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Silver	1.6	0.61	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Thallium	< 1.2	1.2	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Zinc	242	6.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



## Report of Analysis

**Client Sample ID:** SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 24**Lab Sample ID:** JD53458-7F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	13.3	12	ug/l	2	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	7720	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	14.5	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	31.1	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	< 100	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	< 3.0	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	114	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	26.6	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 24			Date Sampled:	10/10/22
Lab Sample ID:	JD53458-7F			Date Received:	10/11/22
Matrix:	AQ - Groundwater Filtered			Percent Solids:	n/a
Project:	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	0.56	0.10	mg/l	1	10/13/22 17:45	MP	EPA 365.3
	444	4.0	mg/l	2	10/19/22 18:51	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-560 15-25' GW MW-560D SOIL T3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-8	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	51.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 13	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	1360	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 3.4	3.4	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	14.5	6.7	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	56.0	17	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	30300	340	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	385	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	854	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	3.6	0.26	mg/kg	5	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	27.5	5.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	< 13	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 3.4	3.4	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 6.7	6.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	212	6.7	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-9F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 120	120	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	443	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	3.7	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	40300	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	3590	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	43.3	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	126	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-9F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.1	0.25	mg/l	1	10/13/22 17:45	MP	EPA 365.3
Sulfate	3090	30	mg/l	15	10/19/22 19:04	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SOIL MW-608D 10-15' GW MW-606S SOIL C3 DAY 24					Date Sampled:	10/10/22
Lab Sample ID:	JD53458-10					Date Received:	10/11/22
Matrix:	SO - Soil					Percent Solids:	76.3
Project:	SANHPAFW: Marcus Hook, PA						

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 3.6	3.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	79.9	3.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	1.1	0.89	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	15.6	4.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	123	4.5	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	25500	89	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	465	3.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	114	2.7	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	10.5	2.0	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	13.1	3.6	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	34.6	3.6	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	1.4	0.89	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 1.8	1.8	mg/kg	2	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	203	4.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.10  
4

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-11F	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	291	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	3.4	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	27100	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	3600	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	47.5	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	248	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S C3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-11F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	0.29	0.10	mg/l	1	10/13/22 17:45	MP	EPA 365.3
	3060	30	mg/l	15	10/19/22 19:42	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.11  
4



## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S SOIL C3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-12	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	71.6
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 9.4	9.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	144	9.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 2.4	2.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	29.5	4.7	mg/kg	1	10/21/22	10/25/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	197	12	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	39600	240	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	565	9.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	124	7.1	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	11.6	2.3	mg/kg	50	10/17/22	10/18/22 LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	13.4	3.8	mg/kg	1	10/21/22	10/25/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	51.9	9.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.4	2.4	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 4.7	4.7	mg/kg	5	10/21/22	10/26/22 ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	414	4.7	mg/kg	1	10/21/22	10/25/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-13F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	330	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	119	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	105	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-13F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.15	0.10	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	1620	16	mg/l	8	10/19/22 19:55	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.13  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S SOIL T3 DAY 24				
<b>Lab Sample ID:</b>	JD53458-14			<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil			<b>Date Received:</b>	10/11/22
				<b>Percent Solids:</b>	70.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 9.8	9.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	111	9.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 2.5	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	24.3	4.9	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	159	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	35500	250	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	428	9.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	165	7.4	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	8.9	1.8	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	16.7	3.9	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	30.3	9.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.5	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 4.9	4.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	311	4.9	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-608D 10-15' GW MW-606S T3 DUP DAY 24**Lab Sample ID:** JD53458-15F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 30	30	ug/l	5	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	264	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cadmium	< 3.0	3.0	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	< 100	100	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 15	15	ug/l	5	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	82.1	50	ug/l	5	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 50	50	ug/l	5	10/17/22	10/24/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S T3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-15F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	0.22	0.10	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	1380	14	mg/l	7	10/19/22 20:08	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.15  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 10-15' GW MW-606S SOIL T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-16			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	66.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 10	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	143	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 2.5	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	30.1	5.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	207	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	41500	250	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	579	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	130	7.6	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	11.5	2.4	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	14.4	4.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	41.0	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.5	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.0	5.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	397	5.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
  - (2) Instrument QC Batch: MA53204
  - (3) Instrument QC Batch: MA53212
  - (4) Prep QC Batch: MP35807
  - (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.16  
4

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-17F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	378000	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 300	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	2190	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	40.8	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	884	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	36.2	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 1000	1000	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	38.8	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-17F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	23.9	2.5	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	2410	22	mg/l	11	10/19/22 20:21	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.17  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D SOIL C3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-18			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	60.3
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	52.7	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic	10000	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 14	14	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	26.5	5.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	305	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	32900	270	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead	6230	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	217	8.2	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	58.7	2.5	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	22.2	4.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	116	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	5.3	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 27	27	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	662	5.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D C3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-19F	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	328000	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 300	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	4880	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	968	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	31.2	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 1000	1000	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D C3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-19F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	21.8	2.5	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	2390	24	mg/l	12	10/19/22 20:34	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.19  
4

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D SOIL C3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-20	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	63.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	47.2	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic	10300	53	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	15.0	13	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	53.6	5.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	268	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	55300	260	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead	5140	53	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	164	7.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	68.8	8.6	mg/kg	200	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	21.4	4.2	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	187	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	7.9	2.6	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 26	26	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc <sup>a</sup>	1130	26	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-21F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	214	120	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Arsenic	101000	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Iron	181	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Manganese	119	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup> SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
  - (2) Instrument QC Batch: MA53188
  - (3) Instrument QC Batch: MA53201
  - (4) Prep QC Batch: MP35746
  - (5) Prep QC Batch: MP35770
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.21  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-21F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	12.8	2.5	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	3190	30	mg/l	15	10/19/22 20:47	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.21  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D SOIL T3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-22			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	58.4
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	58.4	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic	9510	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 14	14	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	42.4	5.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper	327	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	47800	280	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead	7490	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese	205	8.3	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	55.6	8.6	mg/kg	200	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	24.1	4.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium	580	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver	10.0	2.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 28	28	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	1000	28	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-23F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By		Method	Prep Method
Antimony <sup>a</sup>	315	120	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	111000	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 60	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	237	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 60	60	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	111	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 200	200	ug/l	20	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
- (2) Instrument QC Batch: MA53188
- (3) Instrument QC Batch: MA53201
- (4) Prep QC Batch: MP35746
- (5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-23F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	12.4	2.5	mg/l	1	10/13/22 18:05	MP	EPA 365.3
	3250	32	mg/l	16	10/19/22 21:00	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.23  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-608D 25-33' GW MW-606D SOIL T3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-24	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	60.6
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	39.6	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic	9590	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 14	14	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	27.8	5.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper	317	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	35400	270	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead	5790	55	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese	248	8.2	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	54.8	2.7	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	22.1	4.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium	113	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver	5.3	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 27	27	mg/kg	25	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	617	5.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
  - (2) Instrument QC Batch: MA53204
  - (3) Instrument QC Batch: MA53212
  - (4) Prep QC Batch: MP35807
  - (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AO17 BH22 20-28' GW MW-56D C3 DAY 24**Lab Sample ID:** JD53458-25F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 10/10/22**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	63300	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	26000	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	30.3	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	6090	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	43.0	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	181	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-25F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	1.5	0.50	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	866	8.0	mg/l	4	10/19/22 21:13	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-26			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	56.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 12	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	2620	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	3.4	2.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	11.8	5.8	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	175	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	26900	290	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	1330	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	304	8.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	12.0	2.2	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	22.6	4.6	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	22.9	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.9	2.9	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.8	5.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	356	5.8	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.26  
4

## Report of Analysis

**Client Sample ID:** SOIL AO17 BH22 20-28' GW MW-56D C3 DUP DAY 24**Lab Sample ID:** JD53458-27F**Date Sampled:** 10/10/22**Matrix:** AQ - Groundwater Filtered**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	77200	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	12000	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	3220	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	29.5	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D C3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-27F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	2.0	0.50	mg/l	1	10/13/22 18:05	MP	EPA 365.3
	2220	22	mg/l	11	10/19/22 21:26	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.27  
4



Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-28			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	62.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	29.1	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic	5460	21	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	7.5	5.3	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	24.2	5.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	240	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	33000	270	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	3580	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	243	8.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	43.8	2.3	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	23.7	4.2	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	65.8	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	3.3	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.3	5.3	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	617	5.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 24**Lab Sample ID:** JD53458-29F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 10/10/22**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	46500	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	154	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	4.2	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-29F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	5.6	1.3	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	287	2.0	mg/l	1	10/18/22 20:40	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-30			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	67.9
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 10	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	1430	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	2.6	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	18.1	5.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	163	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	31100	250	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	801	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	404	7.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	14.0	2.0	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	18.4	4.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	29.3	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.5	2.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.0	5.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	409	5.0	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-31F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	60.6	6.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Arsenic	49000	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup> SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Iron	356	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Lead	< 3.0	3.0	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Manganese	< 15	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup> SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Selenium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup> SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
- (2) Instrument QC Batch: MA53188
- (3) Instrument QC Batch: MA53201
- (4) Prep QC Batch: MP35746
- (5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D T3 DUP DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-31F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	5.4	1.3	mg/l	1	10/13/22 18:05	MP	EPA 365.3
Sulfate	156	2.0	mg/l	1	10/18/22 21:18	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-32	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	58.5
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	< 11	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	3200	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	4.2	2.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	13.7	5.7	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	219	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	28700	280	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	1340	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	524	8.5	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	18.0	2.8	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	23.4	4.5	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	22.5	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.8	2.8	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.7	5.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	412	5.7	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

**Client Sample ID:** SOIL MW-609D 18-23' GW MW-609D C3 DAY 24**Lab Sample ID:** JD53458-33F**Matrix:** AQ - Groundwater Filtered**Date Sampled:** 10/10/22**Date Received:** 10/11/22**Percent Solids:** n/a**Project:** SANHPAFW: Marcus Hook, PA

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	284000	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 300	300	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	6710	100	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	2070	15	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	27.1	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 1000	1000	ug/l	100	10/17/22	10/24/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	113	20	ug/l	1	10/17/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

(1) Instrument QC Batch: MA53156

(2) Instrument QC Batch: MA53188

(3) Instrument QC Batch: MA53201

(4) Prep QC Batch: MP35746

(5) Prep QC Batch: MP35770

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D C3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-33F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	5.6	1.3	mg/l	1	10/13/22 18:15	MP	EPA 365.3
Sulfate	2210	22	mg/l	11	10/19/22 21:39	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D SOIL C3 DAY 24		
<b>Lab Sample ID:</b>	JD53458-34	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	56.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 12	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	2820	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 3.0	3.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	13.6	6.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	187	15	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	28700	300	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	1470	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	306	9.1	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	12.0	2.4	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	21.2	4.9	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	25.9	12	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 3.0	3.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 6.1	6.1	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	366	6.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D C3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-35F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	< 60	60	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	172000	150	ug/l	50	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	187	150	ug/l	50	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	4270	100	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	1660	15	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	17.6	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium <sup>a</sup>	< 100	100	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	50.8	20	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
- (2) Instrument QC Batch: MA53188
- (3) Instrument QC Batch: MA53204
- (4) Prep QC Batch: MP35746
- (5) Prep QC Batch: MP35821

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SOIL MW-609D 18-23' GW MW-609D C3 DUP DAY 24			Date Sampled:	10/10/22
Lab Sample ID:	JD53458-35F			Date Received:	10/11/22
Matrix:	AQ - Groundwater Filtered			Percent Solids:	n/a
Project:	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	4.8	1.3	mg/l	1	10/13/22 18:15	MP	EPA 365.3
	1970	22	mg/l	11	10/20/22 17:10	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

4.35  
4

# Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D SOIL C3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-36			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	61.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	29.2	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic	4660	22	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 5.4	5.4	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	27.4	5.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	269	14	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	38400	270	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	3290	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	311	8.1	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	27.6	2.7	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	27.0	4.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	50.0	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.7	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 11	11	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	807	5.4	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

# Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-37F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Antimony <sup>a</sup>	96.6	60	ug/l	10	10/19/22	10/25/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	106000	150	ug/l	50	10/19/22	10/25/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium <sup>a</sup>	< 150	150	ug/l	50	10/19/22	10/25/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	< 100	100	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead <sup>a</sup>	< 30	30	ug/l	10	10/19/22	10/25/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	23.8	15	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22	LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium <sup>a</sup>	< 100	100	ug/l	10	10/19/22	10/25/22	ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 10	10	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/19/22	10/20/22	ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
- (2) Instrument QC Batch: MA53188
- (3) Instrument QC Batch: MA53204
- (4) Prep QC Batch: MP35746
- (5) Prep QC Batch: MP35821

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3 DAY 24	<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-37F	<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup>	6.3	1.3	mg/l	1	10/13/22 18:15	MP	EPA 365.3
Sulfate	1020	10	mg/l	5	10/20/22 17:23	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D SOIL T3 DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-38			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	64.0
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony <sup>a</sup>	18.6	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Arsenic <sup>a</sup>	3520	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	3.4	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Cobalt	24.2	5.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	189	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Iron	32800	270	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	2440	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	210	8.0	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Mercury	32.4	2.3	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup> SW846 7471B <sup>4</sup>
Nickel	22.1	4.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	40.3	11	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	< 2.7	2.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 5.3	5.3	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup> SW846 3050B <sup>5</sup>
Zinc	546	5.3	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup> SW846 3050B <sup>5</sup>

- (1) Instrument QC Batch: MA53169
- (2) Instrument QC Batch: MA53204
- (3) Instrument QC Batch: MA53212
- (4) Prep QC Batch: MP35807
- (5) Prep QC Batch: MP35862
- (a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

4.38  
4



Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-39F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	87.2	60	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Arsenic	75300	30	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cadmium	62.6	30	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Cobalt	< 50	50	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Copper	< 10	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Iron	< 100	100	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Lead	< 30	30	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Manganese	74.7	15	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Mercury	< 0.20	0.20	ug/l	1	10/13/22	10/14/22 LM	SW846 7470A <sup>1</sup>	SW846 7470A <sup>4</sup>
Nickel	< 10	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Selenium	< 100	100	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Silver	< 10	10	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>
Thallium	< 100	100	ug/l	10	10/19/22	10/25/22 ND	SW846 6010D <sup>3</sup>	SW846 3010A <sup>5</sup>
Zinc	< 20	20	ug/l	1	10/19/22	10/20/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>5</sup>

- (1) Instrument QC Batch: MA53156
- (2) Instrument QC Batch: MA53188
- (3) Instrument QC Batch: MA53204
- (4) Prep QC Batch: MP35746
- (5) Prep QC Batch: MP35821

RL = Reporting Limit

4.39  
4

Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D T3 DUP DAY 24			<b>Date Sampled:</b>	10/10/22
<b>Lab Sample ID:</b>	JD53458-39F			<b>Date Received:</b>	10/11/22
<b>Matrix:</b>	AQ - Groundwater Filtered			<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA				

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphate, Ortho <sup>a</sup> Sulfate	8.2	1.3	mg/l	1	10/13/22 18:15	MP	EPA 365.3
	661	8.0	mg/l	4	10/20/22 17:35	SS	EPA 300/SW846 9056A

(a) Analysis done out of holding time.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	SOIL MW-609D 18-23' GW MW-609D SOIL T3 DUP DAY 24		
<b>Lab Sample ID:</b>	JD53458-40	<b>Date Sampled:</b>	10/10/22
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	10/11/22
		<b>Percent Solids:</b>	63.8
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method	
Antimony <sup>a</sup>	28.3	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Arsenic	4860	20	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cadmium <sup>a</sup>	< 5.1	5.1	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Cobalt	31.4	5.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Copper <sup>a</sup>	267	13	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Iron	41800	260	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Lead <sup>a</sup>	3580	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Manganese <sup>a</sup>	255	7.7	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Mercury	24.5	2.1	mg/kg	50	10/17/22	10/18/22	LM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>4</sup>
Nickel	26.5	4.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>
Selenium <sup>a</sup>	62.9	10	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Silver <sup>a</sup>	3.1	2.6	mg/kg	5	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Thallium <sup>a</sup>	< 10	10	mg/kg	10	10/21/22	10/26/22	ND	SW846 6010D <sup>3</sup>	SW846 3050B <sup>5</sup>
Zinc	814	5.1	mg/kg	1	10/21/22	10/25/22	ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>5</sup>

(1) Instrument QC Batch: MA53169

(2) Instrument QC Batch: MA53204

(3) Instrument QC Batch: MA53212

(4) Prep QC Batch: MP35807

(5) Prep QC Batch: MP35862

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

JD53458

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VP-090122-146

SGS		CHAIN OF CUSTODY		SGS North America Inc. - Dayton		2235 Route 130, Dayton, NJ 08810		TEL 732-329-0200 FAX 732-329-3499	
Company Name Sanborn Head & Associates		Project Name Evergreen Marcus Hook		Billing Information (if different from Report to)		Company Name Sanborn Head & Associates		Street Address 20 Foundry Street	
Street Address 1015 Virginia Dr, Suite 100		Street 100 Green Street		City Concord, NH, 03301		State NH		Zip 03301	
City Fort Washington, PA, 19034		State PA		City Concord, NH, 03301		State NH		Zip 03301	
Project Contact Shana Whitney		E-mail swhitney@sanbornhead.com		Client Purchase Order #		Project #		4862.04	
Phone # 603-415-6159		Fax #		City Concord, NH, 03301		State NH		Zip 03301	
Sampler(s) Name(s) Michael D. Lee		Phone # 302-786-9553		Project Manager Chelsey Shepsko		Altabio Chelsey Shepsko (shepsko@sanbornhead.com)		Accounts Payable sp@sanbornhead.com	
Lab Sample #		Field ID / Point of Collection		MECHDL Val #		Date		Time	
1 F		Soil MW-560 15-25' GW MW-560D C3 Day 24		10/10/2022		8:00		GW	
2 F		Soil MW-560 15-25' GW MW-560D C3 Day 24		10/10/2022		8:10		Soil	
3 F		Soil MW-560 15-25' GW MW-560D C3 Dup Day 14		10/10/2022		8:15		GW	
4 F		Soil MW-560 15-25' GW MW-560D Soil C3 Dup Day 24		10/10/2022		8:25		Soil	
5 F		Soil MW-560 15-25' GW MW-560D T3 Day 14		10/10/2022		8:30		GW	
6 F		Soil MW-560 15-25' GW MW-560D Soil T3 Day 24		10/10/2022		8:40		Soil	
7 F		Soil MW-560 15-25' GW MW-560D T3 Dup Day 24		10/10/2022		8:45		GW	
8 F		Soil MW-560 15-25' GW MW-560D Soil C3 Dup Day 24		10/10/2022		8:55		Soil	
9 F		Soil MW-608D 10-15' GW MW-608S C3 Day 24		10/10/2022		9:00		GW	
10 F		Soil MW-608D 10-15' GW MW-608S Soil C3 Day 24		10/10/2022		9:10		Soil	
11 F		Soil MW-608D 10-15' GW MW-608S C3 Dup Day 24		10/10/2022		9:15		GW	
12 F		Soil MW-608D 10-15' GW MW-608S Soil C3 Dup Day 24		10/10/2022		9:25		Soil	
13 F		Soil MW-608D 10-15' GW MW-608S T3 Day 24		10/10/2022		9:30		GW	
14 F		Soil MW-608D 10-15' GW MW-608S Soil T3 Day 24		10/10/2022		9:40		Soil	
15 F									
Turnaround Time (Business days)		Approved by (SGS Project Manager) Date:		Commercial "A" (Level 1)		NYASP Category A		Comments / Special Instructions	
<input checked="" type="checkbox"/> Std. 10 Business Days				Commercial "B" (Level 2)		NYASP Category B		SGS Courier	
<input type="checkbox"/> 5 Day RUSH				FULLY (Level 3+4)		State Forms			
<input type="checkbox"/> 3 Day RUSH				NJ Reduced					
<input type="checkbox"/> 2 Day RUSH				X REDT1		X EDO Format SHA EQUIS; Stattec EQUIS			
<input type="checkbox"/> 1 Day RUSH				Commercial "C"		Other			
<input type="checkbox"/> other				NJ Data of Known Quality Protocol Reporting		Commercial "B" = Results + QC Summary			
Emergency & Rush T/A data available via LabLink				NJ Reduced = Results + QC Summary + Partial Raw data					
Requisitioned by: 1		Date Time: 10/10/22 10:35		Requisitioned By: 1		Date Time: 10/11/22		Received By: 2	
Requisitioned by: 2		Date Time:		Requisitioned By: 2		Date Time:		Received By: 3	
Requisitioned by: 3		Date Time:		Requisitioned By: 3		Date Time:		Received By: 4	
Requisitioned by: 4		Date Time:		Requisitioned By: 4		Date Time:		Received By: 5	
Requisitioned by: 5		Date Time:		Requisitioned By: 5		Date Time:		Received By: 6	
Requisitioned by: 6		Date Time:		Requisitioned By: 6		Date Time:		Received By: 7	
Requisitioned by: 7		Date Time:		Requisitioned By: 7		Date Time:		Received By: 8	
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Requisitioned by: 28		Date Time:		Requisitioned By: 28		Date Time:		Received By: 29	
Requisitioned by: 29		Date Time:		Requisitioned By: 29		Date Time:		Received By: 30	
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Requisitioned by: 37		Date Time:		Requisitioned By: 37		Date Time:		Received By: 38	
Requisitioned by: 38		Date Time:		Requisitioned By: 38		Date Time:		Received By: 39	
Requisitioned by: 39		Date Time:		Requisitioned By: 39		Date Time:		Received By: 40	
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Requisitioned by: 48		Date Time:		Requisitioned By: 48		Date Time:		Received By: 49	
Requisitioned by: 49		Date Time:		Requisitioned By: 49		Date Time:		Received By: 50	
Requisitioned by: 50		Date Time:		Requisitioned By: 50		Date Time:		Received By: 51	
Requisitioned by: 51		Date Time:		Requisitioned By: 51		Date Time:		Received By: 52	
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Requisitioned by: 86		Date Time:		Requisitioned By: 86		Date Time:		Received By: 87	
Requisitioned by: 87		Date Time:		Requisitioned By: 87		Date Time:		Received By: 88	
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Requisitioned by: 117		Date Time:		Requisitioned By: 117		Date Time:		Received By: 118	
Requisitioned by: 118		Date Time:		Requisitioned By: 118		Date Time:		Received By: 119	
Requisitioned by: 119		Date Time:		Requisitioned By: 119		Date Time:		Received By: 120	
Requisitioned by: 120		Date Time:		Requisitioned By: 120		Date Time:		Received By: 121	
Requisitioned by: 121		Date Time:		Requisitioned By: 121		Date Time:		Received By: 122	
Requisitioned by: 122		Date Time:		Requisitioned By: 122		Date Time:		Received By: 123	
Requisitioned by: 123		Date Time:		Requisitioned By: 123		Date Time:		Received By: 124	
Requisitioned by: 124		Date Time:		Requisitioned By: 124		Date Time:		Received By: 125	
Requisitioned by: 125		Date Time:		Requisitioned By: 125		Date Time:		Received By: 126	
Requisitioned by: 126		Date Time:		Requisitioned By: 126		Date Time:		Received By: 127	
Requisitioned by: 127		Date Time:		Requisitioned By: 127		Date Time:		Received By: 128	
Requisitioned by: 128		Date Time:		Requisitioned By: 128		Date Time:		Received By: 129	
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Requisitioned by: 130		Date Time:		Requisitioned By: 130		Date Time:		Received By: 131	
Requisitioned by: 131		Date Time:		Requisitioned By: 131		Date Time:		Received By: 132	
Requisitioned by: 132		Date Time:		Requisitioned By: 132		Date Time:		Received By: 133	
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Requisitioned by: 136		Date Time:		Requisitioned By: 136		Date Time:		Received By: 137	
Requisitioned by: 137		Date Time:		Requisitioned By: 137		Date Time:		Received By: 138	
Requisitioned by: 138									

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## 5.1

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JD53458

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SGS		CHAIN OF CUSTODY		SGS North America Inc. - Dayton		2235 Route 130, Dayton, NJ 08810		TEL. 732-329-0200 FAX 732-329-3499		Please merge with SDG:		Bottle Order Control #		SGS Job #	
Company Name Sanborn Head & Associates				Project Name Evergreen Marcus Hook				Billing Information (if different from Report to)				Matrix Codes			
Street Address 1015 Virginia Dr, Suite 100				Street 100 Green Street				City Sanborn Head & Associates				Matrix Codes			
City Fort Washington, PA, 19034				City Marina Hook, PA 19061				State 20 Foundry Street				Matrix Codes			
Project Contact Shana Whitney ewhitney@sanbornhead.com				Project # 4862.04				City Concord, NH, 03301				Matrix Codes			
Phone # 603-415-6159				Client Purchase Order #				State Zp				Matrix Codes			
Sampler(s) Name(s) Michael D. Lee				Project Manager Chelsey Shepsko				Allegation Chelsey Shepsko (shepsko@sanbornhead.com)				Matrix Codes			
Phone # 302-798-9553				Account Payable sp@sanbornhead.com				Matrix Codes				Matrix Codes			
Lab Sample #				Field ID / Point of Collection				MECHWDI Val #				Matrix Codes			
30				Soil AO17 BH22 20-28" GW MW-56D T3 Day 24				10/10/2022 11:30				Matrix Codes			
31				Soil AO17 BH22 20-28" GW MW-56D Soil T3 Day 24				10/10/2022 11:40				Matrix Codes			
32				Soil AO17 BH22 20-28" GW MW-56D T3 Dup Day 24				10/10/2022 11:45				Matrix Codes			
33				Soil AO17 BH22 20-28" GW MW-56D Soil T3 Dup Day 24				10/10/2022 11:55				Matrix Codes			
34				Soil MW-609D 18-23" GW MW-609D C3 Day 24				10/10/2022 14:00				Matrix Codes			
35				Soil MW-609D 18-23" GW MW-609D C3 Day 24				10/10/2022 14:10				Matrix Codes			
36				Soil MW-609D 18-23" GW MW-609D C3 Dup Day 24				10/10/2022 14:15				Matrix Codes			
37				Soil MW-609D 18-23" GW MW-609D Soil T3 Dup Day 24				10/10/2022 14:25				Matrix Codes			
38				Soil MW-609D 18-23" GW MW-609D T3 Day 24				10/10/2022 14:30				Matrix Codes			
39				Soil MW-609D 18-23" GW MW-609D Soil T3 Day 24				10/10/2022 14:40				Matrix Codes			
40				Soil MW-609D 18-23" GW MW-609D T3 Dup Day 24				10/10/2022 14:45				Matrix Codes			
41				Soil MW-609D 18-23" GW MW-609D Soil T3 Dup Day 24				10/10/2022 14:55				Matrix Codes			
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## SGS Sample Receipt Summary

**Job Number:** JD53458

**Client:** SANBORN HEAD & ASSOCIATES, INC.

**Project:** SANHPAFW: MARCUS HOOK, PA

**Date / Time Received:** 10/11/2022 5:30:00 PM

**Delivery Method:** SGS

**Airbill #s:**
**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.6); Cooler 2: (2.0);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.6); Cooler 2: (2.0);

**Cooler Security**
**Y or N**
**Y or N**

- |  |  |
|--|--|
| 1. Custody Seals Present: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |           |
|---|-----------|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> |           |
| 2. Cooler temp verification: _____  |           |
| 3. Cooler media: _____  | Ice (Bag) |
| 4. No. Coolers: _____   | 2         |

**Quality Control Preservation**
**Y or N**
**N/A**

- |   |  |
|---|--|
| 1. Trip Blank present / cooler: <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> |  |
| 2. Trip Blank listed on COC: <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>    |  |
| 3. Samples preserved properly: <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  |  |
| 4. VOCs headspace free: <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>         |  |

**Sample Integrity - Documentation**
**Y or N**

- |   |  |
|---|--|
| 1. Sample labels present on bottles: <input checked="" type="checkbox"/> <input type="checkbox"/>   |  |
| 2. Container labeling complete: <input checked="" type="checkbox"/> <input type="checkbox"/>        |  |
| 3. Sample container label / COC agree: <input checked="" type="checkbox"/> <input type="checkbox"/> |  |

**Sample Integrity - Condition**
**Y or N**

- |   |        |
|---|--------|
| 1. Sample recvd within HT: <input checked="" type="checkbox"/> <input type="checkbox"/>       |        |
| 2. All containers accounted for: <input checked="" type="checkbox"/> <input type="checkbox"/> |        |
| 3. Condition of sample: _____   | Intact |

**Sample Integrity - Instructions**
**Y or N**
**N/A**

- |   |                                     |
|---|-------------------------------------|
| 1. Analysis requested is clear: <input checked="" type="checkbox"/> <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests: <input type="checkbox"/> <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis: <input checked="" type="checkbox"/> <input type="checkbox"/>   |                                     |
| 4. Compositing instructions clear: <input type="checkbox"/> <input type="checkbox"/>                    | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: <input type="checkbox"/> <input type="checkbox"/>                      | <input checked="" type="checkbox"/> |

Test Strip Lot #s:	pH 1-12: 231619	pH 12+: 203117A	Other: (Specify) _____
--------------------	-----------------	-----------------	------------------------

Comments

SM089-03  
Rev. Date 12/7/17

JD53458: Chain of Custody

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Job Change Order: JD53458

Requested Date: 10/13/2022 Received Date: 10/11/2022  
Account Name: Sunoco/Evergreen Due Date: 10/13/2022  
Project Description: SANHPAFW: Marcus Hook, PA Deliverable: REDT2  
C/O Initiated By: VICKYP PM: VP TAT (Days): 14

Sample #: JD53458-3F Change: Revise ID to SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24  
Dept:  
TAT: 14

SOIL MW-560 15-25' GW MW-560D C3 D

Sample #: JD53458-5F Change: Revise ID to SOIL MW-560 15-25' GW MW-560D T3 DAY 24  
Dept:  
TAT: 14

SOIL MW-560 15-25' GW MW-560D T3 D

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-2 Collected: 10-OCT-22 08:10 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D SOIL C3 DAY 24						
JD53458-2	SW846 7471B	18-OCT-22 15:24	LM	17-OCT-22	TW	HG
JD53458-2	SM2540 G 18TH ED M	18-OCT-22 16:35	BG			SOL104
JD53458-2	SW846 6010D	25-OCT-22 10:41	ND	21-OCT-22	SF	AG,CO,CU,FE,MN,NI,PB,SB,SE, TL,ZN
JD53458-2	SW846 6010D	26-OCT-22 09:55	ND	21-OCT-22	SF	AS,CD
JD53458-4 Collected: 10-OCT-22 08:25 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D SOIL C3 DUP DAY 24						
JD53458-4	SW846 7471B	18-OCT-22 15:26	LM	17-OCT-22	TW	HG
JD53458-4	SM2540 G 18TH ED M	18-OCT-22 16:35	BG			SOL104
JD53458-4	SW846 6010D	25-OCT-22 10:56	ND	21-OCT-22	SF	CO,NI,ZN
JD53458-4	SW846 6010D	26-OCT-22 10:09	ND	21-OCT-22	SF	AG,AS,CD,CU,FE,MN,PB,SB,SE, TL
JD53458-6 Collected: 10-OCT-22 08:40 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D SOIL T3 DAY 24						
JD53458-6	SW846 7471B	18-OCT-22 15:27	LM	17-OCT-22	TW	HG
JD53458-6	SM2540 G 18TH ED M	18-OCT-22 16:35	BG			SOL104
JD53458-6	SW846 6010D	25-OCT-22 11:01	ND	21-OCT-22	SF	AG,CO,CU,FE,MN,NI,PB,SB,SE, TL,ZN
JD53458-6	SW846 6010D	26-OCT-22 10:14	ND	21-OCT-22	SF	AS,CD
JD53458-8 Collected: 10-OCT-22 08:55 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D SOIL T3 DUP DAY 24						
JD53458-8	SW846 7471B	18-OCT-22 15:29	LM	17-OCT-22	TW	HG
JD53458-8	SM2540 G 18TH ED M	18-OCT-22 16:35	BG			SOL104
JD53458-8	SW846 6010D	25-OCT-22 11:06	ND	21-OCT-22	SF	CO,NI,ZN
JD53458-8	SW846 6010D	26-OCT-22 10:29	ND	21-OCT-22	SF	AG,AS,CD,CU,FE,MN,PB,SB,SE, TL
JD53458-10 Collected: 10-OCT-22 09:10 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S SOIL C3 DAY 24						
JD53458-10	SW846 7471B	18-OCT-22 15:31	LM	17-OCT-22	TW	HG

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-10 SM2540 G 18TH ED M	18-OCT-22 16:35	BG				SOL104
JD53458-10 SW846 6010D	25-OCT-22 11:20	ND	21-OCT-22	SF		CO,NI,ZN
JD53458-10 SW846 6010D	26-OCT-22 10:33	ND	21-OCT-22	SF		AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-12 Collected: 10-OCT-22 09:25 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S SOIL C3 DUP DAY 24						
JD53458-12 SW846 7471B	18-OCT-22 15:33	LM	17-OCT-22	TW		HG
JD53458-12 SM2540 G 18TH ED M	18-OCT-22 16:35	BG				SOL104
JD53458-12 SW846 6010D	25-OCT-22 11:25	ND	21-OCT-22	SF		CO,NI,ZN
JD53458-12 SW846 6010D	26-OCT-22 10:38	ND	21-OCT-22	SF		AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-14 Collected: 10-OCT-22 09:40 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S SOIL T3 DAY 24						
JD53458-14 SW846 7471B	18-OCT-22 15:55	LM	17-OCT-22	TW		HG
JD53458-14 SM2540 G 18TH ED M	18-OCT-22 16:35	BG				SOL104
JD53458-14 SW846 6010D	25-OCT-22 11:30	ND	21-OCT-22	SF		CO,NI,ZN
JD53458-14 SW846 6010D	26-OCT-22 10:43	ND	21-OCT-22	SF		AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-16 Collected: 10-OCT-22 09:55 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S SOIL T3 DUP DAY 24						
JD53458-16 SW846 7471B	18-OCT-22 15:57	LM	17-OCT-22	TW		HG
JD53458-16 SM2540 G 18TH ED M	18-OCT-22 16:35	BG				SOL104
JD53458-16 SW846 6010D	25-OCT-22 11:34	ND	21-OCT-22	SF		CO,NI,ZN
JD53458-16 SW846 6010D	26-OCT-22 10:48	ND	21-OCT-22	SF		AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-18 Collected: 10-OCT-22 10:10 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D SOIL C3 DAY 24						
JD53458-18 SW846 7471B	18-OCT-22 15:58	LM	17-OCT-22	TW		HG
JD53458-18 SM2540 G 18TH ED M	18-OCT-22 16:35	BG				SOL104
JD53458-18 SW846 6010D	25-OCT-22 11:39	ND	21-OCT-22	SF		CO,NI,ZN
JD53458-18 SW846 6010D	26-OCT-22 10:52	ND	21-OCT-22	SF		AG,CU,FE,MN,SB,SE
JD53458-18 SW846 6010D	26-OCT-22 10:57	ND	21-OCT-22	SF		AS,CD,PB,TL

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-1F Collected: 10-OCT-22 08:00 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D C3 DAY 24						
JD53458-1F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-1F SW846 7470A		14-OCT-22 14:30	LM	13-OCT-22 LM		HG
JD53458-1F EPA 300/SW846 9056A		19-OCT-22 18:25	SS	18-OCT-22 SS		SO4
JD53458-1F SW846 6010D		20-OCT-22 13:25	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,PB,SE,TL,ZN
JD53458-1F SW846 6010D		24-OCT-22 10:17	ND	17-OCT-22 SF		SB
JD53458-20 Collected: 10-OCT-22 10:25 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D SOIL C3 DUP DAY 24						
JD53458-20 SW846 7471B		18-OCT-22 16:29	LM	17-OCT-22 TW		HG
JD53458-20 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-20 SW846 6010D		25-OCT-22 11:44	ND	21-OCT-22 SF		CO,NI
JD53458-20 SW846 6010D		26-OCT-22 11:02	ND	21-OCT-22 SF		AG,CU,FE,MN,SB,SE,ZN
JD53458-20 SW846 6010D		26-OCT-22 11:07	ND	21-OCT-22 SF		AS,CD,PB,TL
JD53458-22 Collected: 10-OCT-22 10:40 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D SOIL T3 DAY 24						
JD53458-22 SW846 7471B		18-OCT-22 16:31	LM	17-OCT-22 TW		HG
JD53458-22 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-22 SW846 6010D		25-OCT-22 11:49	ND	21-OCT-22 SF		CO,NI
JD53458-22 SW846 6010D		26-OCT-22 11:21	ND	21-OCT-22 SF		AG,CU,FE,MN,SB,SE,ZN
JD53458-22 SW846 6010D		26-OCT-22 11:26	ND	21-OCT-22 SF		AS,CD,PB,TL
JD53458-24 Collected: 10-OCT-22 10:55 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D SOIL T3 DUP DAY 24						
JD53458-24 SW846 7471B		18-OCT-22 16:04	LM	17-OCT-22 TW		HG
JD53458-24 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-24 SW846 6010D		25-OCT-22 11:54	ND	21-OCT-22 SF		CO,NI,ZN
JD53458-24 SW846 6010D		26-OCT-22 11:31	ND	21-OCT-22 SF		AG,CU,FE,MN,SB,SE
JD53458-24 SW846 6010D		26-OCT-22 11:36	ND	21-OCT-22 SF		AS,CD,PB,TL

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-26 Collected: 10-OCT-22 11:10 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DAY 24						
JD53458-26 SW846 7471B		18-OCT-22 16:05	LM	17-OCT-22 TW		HG
JD53458-26 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-26 SW846 6010D		25-OCT-22 11:59	ND	21-OCT-22 SF		CO,NI,ZN
JD53458-26 SW846 6010D		26-OCT-22 11:40	ND	21-OCT-22 SF		AG,AS,CD,CU,FE,MN,PB,SB,SE, TL
JD53458-28 Collected: 10-OCT-22 11:25 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DUP DAY 24						
JD53458-28 SW846 7471B		18-OCT-22 16:07	LM	17-OCT-22 TW		HG
JD53458-28 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-28 SW846 6010D		25-OCT-22 12:04	ND	21-OCT-22 SF		CO,NI,ZN
JD53458-28 SW846 6010D		26-OCT-22 11:45	ND	21-OCT-22 SF		AG,CU,FE,MN,PB,SB,SE, TL
JD53458-28 SW846 6010D		26-OCT-22 11:50	ND	21-OCT-22 SF		AS,CD
JD53458-30 Collected: 10-OCT-22 11:40 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DAY 24						
JD53458-30 SW846 7471B		18-OCT-22 16:12	LM	17-OCT-22 TW		HG
JD53458-30 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-30 SW846 6010D		25-OCT-22 12:19	ND	21-OCT-22 SF		CO,NI,ZN
JD53458-30 SW846 6010D		26-OCT-22 11:55	ND	21-OCT-22 SF		AG,AS,CD,CU,FE,MN,PB,SB,SE, TL
JD53458-32 Collected: 10-OCT-22 11:55 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DUP DAY 24						
JD53458-32 SW846 7471B		18-OCT-22 16:14	LM	17-OCT-22 TW		HG
JD53458-32 SM2540 G 18TH ED M		18-OCT-22 16:35	BG			SOL104
JD53458-32 SW846 6010D		25-OCT-22 12:24	ND	21-OCT-22 SF		CO,NI,ZN
JD53458-32 SW846 6010D		26-OCT-22 11:59	ND	21-OCT-22 SF		AG,AS,CD,CU,FE,MN,PB,SB,SE, TL
JD53458-34 Collected: 10-OCT-22 14:10 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D SOIL C3 DAY 24						

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-34 SW846 7471B		18-OCT-22 16:15	LM	17-OCT-22	TW	HG
JD53458-34 SM2540 G 18TH ED M08		18-OCT-22 16:35	BG			SOL104
JD53458-34 SW846 6010D		25-OCT-22 12:28	ND	21-OCT-22	SF	CO,NI,ZN
JD53458-34 SW846 6010D		26-OCT-22 12:14	ND	21-OCT-22	SF	AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-36 Collected: 10-OCT-22 14:25 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D SOIL C3 DUP DAY 24						
JD53458-36 SW846 7471B		18-OCT-22 16:17	LM	17-OCT-22	TW	HG
JD53458-36 SM2540 G 18TH ED M08		18-OCT-22 16:35	BG			SOL104
JD53458-36 SW846 6010D		25-OCT-22 12:33	ND	21-OCT-22	SF	CO,NI,ZN
JD53458-36 SW846 6010D		26-OCT-22 12:19	ND	21-OCT-22	SF	AG,CU,FE,MN,PB,SB,SE
JD53458-36 SW846 6010D		26-OCT-22 12:24	ND	21-OCT-22	SF	AS,CD,TL
JD53458-38 Collected: 10-OCT-22 14:40 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D SOIL T3 DAY 24						
JD53458-38 SW846 7471B		18-OCT-22 16:19	LM	17-OCT-22	TW	HG
JD53458-38 SM2540 G 18TH ED M08		18-OCT-22 16:35	BG			SOL104
JD53458-38 SW846 6010D		25-OCT-22 12:38	ND	21-OCT-22	SF	CO,NI,ZN
JD53458-38 SW846 6010D		26-OCT-22 12:28	ND	21-OCT-22	SF	AG,AS,CD,CU,FE,MN,PB,SB,SE,TL
JD53458-3F Collected: 10-OCT-22 08:15 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D C3 DUP DAY 24						
JD53458-3F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-3F SW846 7470A		14-OCT-22 14:31	LM	13-OCT-22	LM	HG
JD53458-3F EPA 300/SW846 9056A19		19-OCT-22 18:38	SS	18-OCT-22	SS	SO4
JD53458-3F SW846 6010D		20-OCT-22 13:30	ND	17-OCT-22	SF	AG,AS,CD,CO,CU,FE,MN,NI,PB,SE,TL,ZN
JD53458-3F SW846 6010D		24-OCT-22 10:22	ND	17-OCT-22	SF	SB
JD53458-40 Collected: 10-OCT-22 14:55 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D SOIL T3 DUP DAY 24						
JD53458-40 SW846 7471B		18-OCT-22 16:21	LM	17-OCT-22	TW	HG
JD53458-40 SM2540 G 18TH ED M08		18-OCT-22 16:35	BG			SOL104
JD53458-40 SW846 6010D		25-OCT-22 12:43	ND	21-OCT-22	SF	CO,NI,ZN

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-40 SW846 6010D		26-OCT-22 12:33	ND	21-OCT-22 SF		AG,CU,FE,MN,PB,SB,SE
JD53458-40 SW846 6010D		26-OCT-22 12:38	ND	21-OCT-22 SF		AS,CD,TL
JD53458-5F Collected: 10-OCT-22 08:30 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D T3 DAY 24						
JD53458-5F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-5F SW846 7470A		14-OCT-22 14:33	LM	13-OCT-22 LM		HG
JD53458-5F EPA 300/SW846 9056A18-OCT-22 17:39		18-OCT-22 SS	SS	18-OCT-22 SS		SO4
JD53458-5F SW846 6010D		20-OCT-22 13:35	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,PB,SE,TL,ZN
JD53458-5F SW846 6010D		24-OCT-22 10:27	ND	17-OCT-22 SF		SB
JD53458-7F Collected: 10-OCT-22 08:45 By: MDL Received: 11-OCT-22 By: KG SOIL MW-560 15-25' GW MW-560D T3 DUP DAY 24						
JD53458-7F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-7F SW846 7470A		14-OCT-22 14:34	LM	13-OCT-22 LM		HG
JD53458-7F EPA 300/SW846 9056A19-OCT-22 18:51		18-OCT-22 SS	SS	18-OCT-22 SS		SO4
JD53458-7F SW846 6010D		20-OCT-22 13:50	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,PB,SE,TL,ZN
JD53458-7F SW846 6010D		24-OCT-22 10:31	ND	17-OCT-22 SF		SB
JD53458-9F Collected: 10-OCT-22 09:00 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S C3 DAY 24						
JD53458-9F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-9F SW846 7470A		14-OCT-22 14:39	LM	13-OCT-22 LM		HG
JD53458-9F EPA 300/SW846 9056A19-OCT-22 19:04		18-OCT-22 SS	SS	18-OCT-22 SS		SO4
JD53458-9F SW846 6010D		20-OCT-22 13:55	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,ZN
JD53458-9F SW846 6010D		24-OCT-22 10:36	ND	17-OCT-22 SF		PB,SB,SE,TL
JD53458-11F Collected: 10-OCT-22 09:15 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S C3 DUP DAY 24						
JD53458-11F EPA 365.3		13-OCT-22 17:45	MP			OPO4
JD53458-11F SW846 7470A		14-OCT-22 14:40	LM	13-OCT-22 LM		HG
JD53458-11F EPA 300/SW846 9056A19-OCT-22 19:42		18-OCT-22 SS	SS	18-OCT-22 SS		SO4
JD53458-11F SW846 6010D		20-OCT-22 14:00	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,ZN
JD53458-11F SW846 6010D		24-OCT-22 10:41	ND	17-OCT-22 SF		PB,SB,SE,TL

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-13ICollected: 10-OCT-22 09:30 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S T3 DAY 24						
JD53458-13IEPA 365.3		13-OCT-22 18:05	MP			OPO4
JD53458-13ISW846 7470A		14-OCT-22 14:42	LM	13-OCT-22 LM		HG
JD53458-13IEPA 300/SW846 9056A		19-OCT-22 19:55	SS	18-OCT-22 SS		SO4
JD53458-13ISW846 6010D		20-OCT-22 14:06	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,ZN
JD53458-13ISW846 6010D		24-OCT-22 10:46	ND	17-OCT-22 SF		PB,SB,SE,TL
JD53458-15ICollected: 10-OCT-22 09:45 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 10-15' GW MW-606S T3 DUP DAY 24						
JD53458-15IEPA 365.3		13-OCT-22 18:05	MP			OPO4
JD53458-15ISW846 7470A		14-OCT-22 14:43	LM	13-OCT-22 LM		HG
JD53458-15IEPA 300/SW846 9056A		19-OCT-22 20:08	SS	18-OCT-22 SS		SO4
JD53458-15ISW846 6010D		20-OCT-22 14:11	ND	17-OCT-22 SF		AG,AS,CD,CO,CU,FE,MN,NI,ZN
JD53458-15ISW846 6010D		24-OCT-22 10:51	ND	17-OCT-22 SF		PB,SB,SE,TL
JD53458-17ICollected: 10-OCT-22 10:00 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D C3 DAY 24						
JD53458-17IEPA 365.3		13-OCT-22 18:05	MP			OPO4
JD53458-17ISW846 7470A		14-OCT-22 14:44	LM	13-OCT-22 LM		HG
JD53458-17IEPA 300/SW846 9056A		19-OCT-22 20:21	SS	18-OCT-22 SS		SO4
JD53458-17ISW846 6010D		20-OCT-22 14:16	ND	17-OCT-22 SF		AG,CO,CU,FE,MN,NI,ZN
JD53458-17ISW846 6010D		24-OCT-22 11:06	ND	17-OCT-22 SF		PB,SB,SE
JD53458-17ISW846 6010D		24-OCT-22 11:11	ND	17-OCT-22 SF		AS,CD,TL
JD53458-19ICollected: 10-OCT-22 10:15 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D C3 DUP DAY 24						
JD53458-19IEPA 365.3		13-OCT-22 18:05	MP			OPO4
JD53458-19ISW846 7470A		14-OCT-22 14:46	LM	13-OCT-22 LM		HG
JD53458-19IEPA 300/SW846 9056A		19-OCT-22 20:34	SS	18-OCT-22 SS		SO4
JD53458-19ISW846 6010D		20-OCT-22 14:21	ND	17-OCT-22 SF		AG,CO,CU,FE,MN,NI,ZN
JD53458-19ISW846 6010D		24-OCT-22 11:15	ND	17-OCT-22 SF		PB,SB,SE
JD53458-19ISW846 6010D		24-OCT-22 11:20	ND	17-OCT-22 SF		AS,CD,TL



## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-21K Collected: 10-OCT-22 10:30 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D T3 DAY 24						
JD53458-21K	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-21K	SW846 7470A	14-OCT-22 14:47	LM	13-OCT-22	LM	HG
JD53458-21K	EPA 300/SW846 9056A	19-OCT-22 20:47	SS	18-OCT-22	SS	SO4
JD53458-21K	SW846 6010D	20-OCT-22 14:26	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-21K	SW846 6010D	24-OCT-22 11:25	ND	17-OCT-22	SF	AS,CD,PB,SB,SE,TL
JD53458-23K Collected: 10-OCT-22 10:45 By: MDL Received: 11-OCT-22 By: KG SOIL MW-608D 25-33' GW MW-606D T3 DUP DAY 24						
JD53458-23K	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-23K	SW846 7470A	14-OCT-22 14:49	LM	13-OCT-22	LM	HG
JD53458-23K	EPA 300/SW846 9056A	19-OCT-22 21:00	SS	18-OCT-22	SS	SO4
JD53458-23K	SW846 6010D	20-OCT-22 14:41	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-23K	SW846 6010D	24-OCT-22 11:30	ND	17-OCT-22	SF	AS,CD,PB,SB,SE,TL
JD53458-25K Collected: 10-OCT-22 11:00 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D C3 DAY 24						
JD53458-25K	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-25K	SW846 7470A	14-OCT-22 14:53	LM	13-OCT-22	LM	HG
JD53458-25K	EPA 300/SW846 9056A	19-OCT-22 21:13	SS	18-OCT-22	SS	SO4
JD53458-25K	SW846 6010D	20-OCT-22 14:46	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-25K	SW846 6010D	24-OCT-22 11:35	ND	17-OCT-22	SF	AS,CD,PB,SB,SE,TL
JD53458-27K Collected: 10-OCT-22 11:15 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D C3 DUP DAY 24						
JD53458-27K	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-27K	SW846 7470A	14-OCT-22 14:55	LM	13-OCT-22	LM	HG
JD53458-27K	EPA 300/SW846 9056A	19-OCT-22 21:26	SS	18-OCT-22	SS	SO4
JD53458-27K	SW846 6010D	20-OCT-22 14:52	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-27K	SW846 6010D	24-OCT-22 11:40	ND	17-OCT-22	SF	AS,CD,PB,SB,SE,TL
JD53458-29K Collected: 10-OCT-22 11:30 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D T3 DAY 24						

## Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA

Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-29	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-29	SW846 7470A	14-OCT-22 14:56	LM	13-OCT-22	LM	HG
JD53458-29	EPA 300/SW846 9056A	18-OCT-22 20:40	SS	18-OCT-22	SS	SO4
JD53458-29	SW846 6010D	20-OCT-22 14:57	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,PB,SE,TL,ZN
JD53458-29	SW846 6010D	24-OCT-22 11:44	ND	17-OCT-22	SF	AS,CD,SB
JD53458-31 Collected: 10-OCT-22 11:45 By: MDL Received: 11-OCT-22 By: KG SOIL AO17 BH22 20-28' GW MW-56D T3 DUP DAY 24						
JD53458-31	EPA 365.3	13-OCT-22 18:05	MP			OPO4
JD53458-31	SW846 7470A	14-OCT-22 14:58	LM	13-OCT-22	LM	HG
JD53458-31	EPA 300/SW846 9056A	18-OCT-22 21:18	SS	18-OCT-22	SS	SO4
JD53458-31	SW846 6010D	20-OCT-22 15:02	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,PB,SB,SE,TL,ZN
JD53458-31	SW846 6010D	24-OCT-22 11:59	ND	17-OCT-22	SF	AS,CD
JD53458-33 Collected: 10-OCT-22 14:00 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D C3 DAY 24						
JD53458-33	EPA 365.3	13-OCT-22 18:15	MP			OPO4
JD53458-33	SW846 7470A	14-OCT-22 14:59	LM	13-OCT-22	LM	HG
JD53458-33	EPA 300/SW846 9056A	19-OCT-22 21:39	SS	18-OCT-22	SS	SO4
JD53458-33	SW846 6010D	20-OCT-22 15:07	ND	17-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-33	SW846 6010D	24-OCT-22 12:04	ND	17-OCT-22	SF	PB,SB,SE
JD53458-33	SW846 6010D	24-OCT-22 12:09	ND	17-OCT-22	SF	AS,CD,TL
JD53458-35 Collected: 10-OCT-22 14:15 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D C3 DUP DAY 24						
JD53458-35	EPA 365.3	13-OCT-22 18:15	MP			OPO4
JD53458-35	SW846 7470A	14-OCT-22 15:01	LM	13-OCT-22	LM	HG
JD53458-35	SW846 6010D	20-OCT-22 12:21	ND	19-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-35	EPA 300/SW846 9056A	20-OCT-22 17:10	SS	18-OCT-22	SS	SO4
JD53458-35	SW846 6010D	25-OCT-22 08:54	ND	19-OCT-22	SF	PB,SB,SE,TL
JD53458-35	SW846 6010D	25-OCT-22 08:59	ND	19-OCT-22	SF	AS,CD
JD53458-37 Collected: 10-OCT-22 14:30 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D T3 DAY 24						

Internal Sample Tracking Chronicle

Sunoco/Evergreen

Job No: JD53458

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD53458-37	EPA 365.3	13-OCT-22 18:15	MP			OPO4
JD53458-37	SW846 7470A	14-OCT-22 15:02	LM	13-OCT-22	LM	HG
JD53458-37	SW846 6010D	20-OCT-22 12:26	ND	19-OCT-22	SF	AG,CO,CU,FE,MN,NI,TL,ZN
JD53458-37	EPA 300/SW846 9056A	20-OCT-22 17:23	SS	18-OCT-22	SS	SO4
JD53458-37	SW846 6010D	25-OCT-22 09:04	ND	19-OCT-22	SF	PB,SB,SE
JD53458-37	SW846 6010D	25-OCT-22 09:09	ND	19-OCT-22	SF	AS,CD
JD53458-39 Collected: 10-OCT-22 14:45 By: MDL Received: 11-OCT-22 By: KG SOIL MW-609D 18-23' GW MW-609D T3 DUP DAY 24						
JD53458-39	EPA 365.3	13-OCT-22 18:15	MP			OPO4
JD53458-39	SW846 7470A	14-OCT-22 15:04	LM	13-OCT-22	LM	HG
JD53458-39	SW846 6010D	20-OCT-22 12:11	ND	19-OCT-22	SF	AG,CO,CU,FE,MN,NI,ZN
JD53458-39	EPA 300/SW846 9056A	20-OCT-22 17:35	SS	18-OCT-22	SS	SO4
JD53458-39	SW846 6010D	25-OCT-22 08:44	ND	19-OCT-22	SF	AS,CD,PB,SB,SE,TL

# SGS Internal Chain of Custody

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**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-1.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-1F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-1F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-1F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-1F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-1F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-1F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-1F.1
JD53458-1F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-1F.1
JD53458-1F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-1F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-1F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-1F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-1F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-1F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-1F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-2.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-2.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-2.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-2.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-2.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-2.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-2.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-2.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-2.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-2.1
JD53458-2.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-2.1
JD53458-2.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-3.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-3F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-3F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-3F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-3F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-3F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-3F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-3F.1
JD53458-3F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-3F.1

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-3F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-3F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-3F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-3F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-3F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-3F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-3F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-4.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-4.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-4.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-4.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-4.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-4.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-4.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-4.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-4.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-4.1
JD53458-4.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-4.1
JD53458-4.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-5.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-5F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-5F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-5F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-5F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-5F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-5F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-5F.1
JD53458-5F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-5F.1
JD53458-5F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-5F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-5F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-5F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-5F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-5F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-5F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-6.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-6.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-6.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-6.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-6.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-6.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-6.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-6.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-6.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-6.1
JD53458-6.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-6.1
JD53458-6.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-7.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-7F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-7F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-7F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-7F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-7F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-7F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-7F.1
JD53458-7F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-7F.1
JD53458-7F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-7F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-7F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-7F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-7F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-7F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-7F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-8.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-8.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-8.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-8.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-8.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-8.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-8.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-8.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage

# SGS Internal Chain of Custody

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**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-8.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-8.1
JD53458-8.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-8.1
JD53458-8.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-9.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-9F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-9F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-9F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-9F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-9F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-9F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-9F.1
JD53458-9F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-9F.1
JD53458-9F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-9F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-9F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-9F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-9F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-9F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-9F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-10.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-10.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-10.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-10.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-10.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-10.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-10.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-10.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-10.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-10.1
JD53458-10.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-10.1
JD53458-10.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-11.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-11F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-11F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-11F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-11F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage



# SGS Internal Chain of Custody

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**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-11F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-11F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-11F.1
JD53458-11F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-11F.1
JD53458-11F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-11F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-11F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-11F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-11F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-11F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-11F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-12.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-12.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-12.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-12.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-12.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-12.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-12.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-12.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-12.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-12.1
JD53458-12.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-12.1
JD53458-12.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-13.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-13F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-13F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-13F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-13F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-13F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-13F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-13F.1
JD53458-13F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-13F.1
JD53458-13F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-13F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-13F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-13F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				



# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-13F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-13F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-13F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-14.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-14.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-14.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-14.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-14.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-14.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-14.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-14.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-14.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-14.1
JD53458-14.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-14.1
JD53458-14.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-15.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-15F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-15F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-15F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-15F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-15F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-15F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-15F.1
JD53458-15F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-15F.1
JD53458-15F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-15F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-15F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-15F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-15F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-15F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-15F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-16.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-16.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-16.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-16.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-16.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-16.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
stage				
JD53458-16.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-16.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-16.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-16.1
JD53458-16.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-16.1
JD53458-16.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-17.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-17F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-17F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-17F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-17F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-17F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-17F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-17F.1
JD53458-17F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-17F.1
JD53458-17F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-17F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-17F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-17F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-17F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-17F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-17F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-18.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-18.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-18.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-18.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-18.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-18.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-18.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-18.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-18.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-18.1
JD53458-18.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-18.1
JD53458-18.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-19.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-19F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-19F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-19F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-19F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-19F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-19F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-19F.1
JD53458-19F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-19F.1
JD53458-19F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-19F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-19F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-19F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-19F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-19F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-19F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-20.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-20.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-20.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-20.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-20.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-20.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
JD53458-20.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-20.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-20.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-20.1
JD53458-20.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-20.1
JD53458-20.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-21.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-21F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-21F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-21F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-21F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-21F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-21F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-21F.1
JD53458-21F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-21F.1
JD53458-21F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage

# SGS Internal Chain of Custody

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**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-21F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-21F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-21F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-21F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-21F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-21F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-22.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-22.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-22.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-22.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-22.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-22.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-22.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-22.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-22.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-22.1
JD53458-22.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-22.1
JD53458-22.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-23.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-23F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-23F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-23F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-23F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-23F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-23F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-23F.1
JD53458-23F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-23F.1
JD53458-23F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-23F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-23F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-23F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-23F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-23F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-23F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-24.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-24.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-24.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-24.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-24.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-24.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-24.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-24.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-24.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-24.1
JD53458-24.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-24.1
JD53458-24.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-25.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-25F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-25F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-25F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-25F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-25F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-25F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-25F.1
JD53458-25F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-25F.1
JD53458-25F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-25F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-25F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-25F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-25F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-25F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-25F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-26.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-26.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-26.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-26.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-26.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-26.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-26.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-26.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-26.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-26.1
JD53458-26.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-26.1

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-26.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-27.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-27F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-27F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-27F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-27F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-27F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-27F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-27F.1
JD53458-27F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-27F.1
JD53458-27F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-27F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-27F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-27F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-27F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-27F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-27F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-28.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-28.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-28.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-28.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-28.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-28.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-28.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-28.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-28.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-28.1
JD53458-28.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-28.1
JD53458-28.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-29.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-29F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-29F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-29F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-29F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-29F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage



# SGS Internal Chain of Custody

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**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-29F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-29F.1
JD53458-29F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-29F.1
JD53458-29F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-29F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-29F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-29F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-29F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-29F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-29F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-30.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-30.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-30.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-30.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-30.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-30.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-30.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-30.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-30.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-30.1
JD53458-30.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-30.1
JD53458-30.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-31.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-31F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-31F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-31F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-31F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-31F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-31F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-31F.1
JD53458-31F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-31F.1
JD53458-31F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-31F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-31F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-31F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-31F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-31F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-31F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-32.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-32.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-32.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-32.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-32.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-32.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-32.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-32.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-32.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-32.1
JD53458-32.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-32.1
JD53458-32.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-33.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-33F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-33F.1	Secured Storage	Benjamin Gaines	10/16/22 16:46	Retrieve from Storage
JD53458-33F.1	Benjamin Gaines	Secured Staging Area	10/16/22 16:46	Return to Storage
JD53458-33F.1	Secured Staging Area	John Azer	10/17/22 07:37	Retrieve from Storage
JD53458-33F.1	John Azer	Secured Storage	10/17/22 11:09	Return to Storage
JD53458-33F.1.1	John Azer	Metals Digestion	10/17/22 10:43	Digestate from JD53458-33F.1
JD53458-33F.1.1	Metals Digestion	John Azer	10/17/22 10:44	Digestate from JD53458-33F.1
JD53458-33F.1.1	John Azer	Metals Digestate Storage	10/17/22 10:44	Return to Storage
JD53458-33F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-33F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-33F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-33F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-33F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-33F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-34.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-34.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-34.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-34.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-34.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-34.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-34.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage



# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-34.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-34.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-34.1
JD53458-34.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-34.1
JD53458-34.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-35.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-35F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-35F.1	Christian King	Secured Staging Area	10/18/22 18:53	Return to Storage
JD53458-35F.1	Secured Staging Area	Sean Sweeney	10/19/22 08:16	Retrieve from Storage
JD53458-35F.1	Sean Sweeney	Secured Storage	10/19/22 14:19	Return to Storage
JD53458-35F.1.1	Sean Sweeney	Metals Digestion	10/19/22 12:24	Digestate from JD53458-35F.1
JD53458-35F.1.1	Metals Digestion	Sean Sweeney	10/19/22 12:25	Digestate from JD53458-35F.1
JD53458-35F.1.1	Sean Sweeney	Metals Digestate Storage	10/19/22 12:25	Return to Storage
JD53458-35F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-35F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-35F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-35F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-35F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-35F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-35F.2	Secured Storage	Dave Hunkele	10/20/22 15:07	Retrieve from Storage
JD53458-35F.2	Dave Hunkele	Secured Staging Area	10/20/22 15:07	Return to Storage
JD53458-36.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-36.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-36.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-36.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-36.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-36.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
JD53458-36.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-36.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-36.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-36.1
JD53458-36.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-36.1
JD53458-36.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-37.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage

# SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-37F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-37F.1	Christian King	Secured Staging Area	10/18/22 18:53	Return to Storage
JD53458-37F.1	Secured Staging Area	Sean Sweeney	10/19/22 08:16	Retrieve from Storage
JD53458-37F.1	Sean Sweeney	Secured Storage	10/19/22 14:19	Return to Storage
JD53458-37F.1.1	Sean Sweeney	Metals Digestion	10/19/22 12:24	Digestate from JD53458-37F.1
JD53458-37F.1.1	Metals Digestion	Sean Sweeney	10/19/22 12:25	Digestate from JD53458-37F.1
JD53458-37F.1.1	Sean Sweeney	Metals Digestate Storage	10/19/22 12:25	Return to Storage
JD53458-37F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-37F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-37F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-37F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-37F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-37F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-38.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-38.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-38.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-38.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-38.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-38.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
JD53458-38.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-38.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-38.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-38.1
JD53458-38.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-38.1
JD53458-38.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage
JD53458-39.1	Epiphania Njoku	Secured Storage	10/12/22 15:30	Return to Storage
JD53458-39F.1	Joshua Reitan	Secured Storage	10/13/22 20:57	Return to Storage
JD53458-39F.1	Christian King	Secured Staging Area	10/18/22 18:53	Return to Storage
JD53458-39F.1	Secured Staging Area	Sean Sweeney	10/19/22 08:16	Retrieve from Storage
JD53458-39F.1	Sean Sweeney	Secured Storage	10/19/22 14:19	Return to Storage
JD53458-39F.1.1	Sean Sweeney	Metals Digestion	10/19/22 12:24	Digestate from JD53458-39F.1
JD53458-39F.1.1	Metals Digestion	Sean Sweeney	10/19/22 12:25	Digestate from JD53458-39F.1
JD53458-39F.1.1	Sean Sweeney	Metals Digestate Storage	10/19/22 12:25	Return to Storage

## SGS Internal Chain of Custody

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA  
**Received:** 10/11/22

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD53458-39F.2	Secured Storage	Todd Shoemaker	10/12/22 15:09	Retrieve from Storage
JD53458-39F.2	Todd Shoemaker	Secured Staging Area	10/12/22 15:10	Return to Storage
JD53458-39F.2	Secured Storage	Dave Hunkele	10/18/22 10:35	Retrieve from Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
JD53458-39F.2	Dave Hunkele	Secured Staging Area	10/18/22 10:35	Return to Storage
JD53458-39F.2	Secured Staging Area	Sarah Sarantopoulos	10/18/22 17:37	Retrieve from Storage
JD53458-39F.2	Sarah Sarantopoulos	Secured Storage	10/19/22 19:04	Return to Storage
JD53458-40.1	Epiphania Njoku	Secured Storage	10/12/22 15:11	Return to Storage
JD53458-40.1	Secured Storage	Todd Shoemaker	10/17/22 11:17	Retrieve from Storage
JD53458-40.1	Todd Shoemaker	Secured Staging Area	10/17/22 11:17	Return to Storage
JD53458-40.1	Secured Staging Area	Lauren Matthews	10/17/22 11:39	Retrieve from Storage
JD53458-40.1	Lauren Matthews	Secured Storage	10/17/22 18:15	Return to Storage
JD53458-40.1	Christian King	Secured Staging Area	10/21/22 00:21	Return to Storage
stage				
JD53458-40.1	Secured Staging Area	John Azer	10/21/22 07:19	Retrieve from Storage
JD53458-40.1	John Azer	Secured Storage	10/21/22 12:17	Return to Storage
JD53458-40.1.1	John Azer	Metals Digestion	10/21/22 10:05	Digestate from JD53458-40.1
JD53458-40.1.1	Metals Digestion	John Azer	10/21/22 10:05	Digestate from JD53458-40.1
JD53458-40.1.1	John Azer	Metals Digestate Storage	10/21/22 10:05	Return to Storage

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
Analyst: LM Run ID: MA53156  
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:59	MA53156-STD1	1		b=1.6444e-004,c=1.7723e-001,rho=0.9998195
14:00	MA53156-STD2	1		STDB
14:02	MA53156-STD3	1		STDC
14:03	MA53156-STD4	1		STDD
14:05	MA53156-STD5	1		STDE
14:07	MA53156-STD6	1		STDF
14:12	MA53156-STD7	1		STDC
14:14	ZZZZZZ	1		
14:16	MA53156-ICV1	1		
14:17	MA53156-ICB1	1		
14:19	MA53156-CCV1	1		
14:20	MA53156-CCB1	1		
14:22	MA53156-CRI1	1		
14:23	MP35746-MB1	1		
14:25	MP35746-B1	1		
14:26	MP35746-S1	1		
14:28	MP35746-S2	1		
14:30	JD53458-1F	1		
14:31	JD53458-3F	1		
14:33	JD53458-5F	1		
14:34	JD53458-7F	1		
14:36	MA53156-CCV2	1		
14:37	MA53156-CCB2	1		
14:39	JD53458-9F	1		
14:40	JD53458-11F	1		
14:42	JD53458-13F	1		
14:43	JD53458-15F	1		
14:44	JD53458-17F	1		
14:46	JD53458-19F	1		
14:47	JD53458-21F	1		
14:49	JD53458-23F	1		
14:50	MA53156-CCV3	1		
14:52	MA53156-CCB3	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22  
Run ID: MA53156  
Methods: SW846 7470A

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:53	JD53458-25F	1		
14:55	JD53458-27F	1		
14:56	JD53458-29F	1		
14:58	JD53458-31F	1		
14:59	JD53458-33F	1		
15:01	JD53458-35F	1		
15:02	JD53458-37F	1		
15:04	JD53458-39F	1		
----->	Last reportable sample/prep for job JD53458			
15:05	MA53156-CCV4	1		
15:06	MA53156-CCB4	1		
15:08	MA53156-CRI2	1		
15:10	MA53156-CCV5	1		
15:11	MA53156-CCB5	1		
----->	Last reportable CCB for job JD53458			
15:13	MP35747-MB1	1		
15:14	MP35747-B1	1		
15:16	MP35747-S1	1		
15:17	MP35747-S2	1		
15:19	DA49817-1	1		(sample used for QC only; not part of login JD53458)
15:20	MA53156-CCV6	1		
15:22	MA53156-CCB6	1		
15:34	MP35748-MB1	1		
15:36	MP35748-B1	1		
15:37	MP35748-S1	1		
15:39	MP35748-S2	1		
15:41	JD53325-1	1		(sample used for QC only; not part of login JD53458)
15:42	ZZZZZZ	1		
15:44	MA53156-CCV7	1		
15:45	MA53156-CCB7	1		
15:47	ZZZZZZ	1		
15:48	ZZZZZZ	1		
15:50	ZZZZZZ	1		
15:51	ZZZZZZ	1		
15:52	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22      Methods: SW846 7470A  
Run ID: MA53156

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:54	ZZZZZZ	1		
15:55	MA53156-CCV8	1		
15:57	MA53156-CCB8	1		
15:58	ZZZZZZ	1		
16:00	ZZZZZZ	1		
16:01	ZZZZZZ	1		
16:03	ZZZZZZ	1		
16:04	ZZZZZZ	1		
16:05	ZZZZZZ	1		
16:09	ZZZZZZ	1		
16:11	MA53156-CCV9	1		
16:12	MA53156-CCB9	1		
16:14	MP35749-MB1	1		
16:15	MP35749-B1	1		
16:16	MP35749-S1	1		
16:18	MP35749-S2	1		
16:20	JD53319-1	1		(sample used for QC only; not part of login JD53458)
16:22	ZZZZZZ	1		
16:23	MA53156-CCV10	1		
16:24	MA53156-CCB10	1		
16:26	ZZZZZZ	1		
16:28	ZZZZZZ	1		
16:29	ZZZZZZ	1		
16:30	ZZZZZZ	1		
16:32	ZZZZZZ	1		
16:33	ZZZZZZ	1		
16:35	MA53156-CCV11	1		
16:36	MA53156-CCB11	1		
16:38	ZZZZZZ	1		
16:39	ZZZZZZ	1		
16:40	ZZZZZZ	1		
16:42	ZZZZZZ	1		
16:43	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
Analyst: LM Run ID: MA53156  
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:45	ZZZZZZ	1		
16:46	MA53156-CCV12	1		
16:48	MA53156-CCB12	1		
16:49	MP35765-MB1	1		
16:51	MP35765-B1	1		
16:52	MP35765-S1	1		
16:54	MP35765-S2	1		
16:55	JD53513-1A	1		(sample used for QC only; not part of login JD53458)
16:57	ZZZZZZ	1		
16:59	ZZZZZZ	1		
17:00	ZZZZZZ	1		
17:01	MA53156-CCV13	1		
17:03	MA53156-CCB13	1		
17:05	ZZZZZZ	1		
17:06	ZZZZZZ	1		
17:07	ZZZZZZ	1		
17:09	ZZZZZZ	1		
17:10	ZZZZZZ	1		
17:12	ZZZZZZ	1		
17:13	ZZZZZZ	1		
17:15	ZZZZZZ	1		
17:16	MA53156-CCV14	1		
17:17	MA53156-CCB14	1		
17:19	ZZZZZZ	1		
17:21	ZZZZZZ	1		
17:22	ZZZZZZ	1		
17:23	ZZZZZZ	1		
17:25	ZZZZZZ	1		
17:26	ZZZZZZ	1		
17:28	ZZZZZZ	1		
17:29	ZZZZZZ	1		
17:31	MA53156-CCV15	1		
17:32	MA53156-CCB15	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22      Methods: SW846 7470A  
Run ID: MA53156

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:34	MP35767-MB1	1		
17:35	MP35767-B1	1		
17:37	MP35767-S1	1		
17:39	MP35767-S2	1		
17:40	JD53513-21A	1		(sample used for QC only; not part of login JD53458)
17:42	ZZZZZZ	1		
17:43	ZZZZZZ	1		
17:45	MA53156-CCV16	1		
17:46	MA53156-CCB16	1		
17:48	ZZZZZZ	1		
17:50	ZZZZZZ	1		
17:51	ZZZZZZ	1		
17:52	ZZZZZZ	1		
17:54	ZZZZZZ	1		
17:55	ZZZZZZ	1		
17:57	ZZZZZZ	1		
17:58	MA53156-CCV17	1		
18:00	MA53156-CCB17	1		
18:02	MP35767-MB1	1		
18:03	MA53156-CCV18	1		
18:05	MA53156-CCB18	1		

Refer to raw data for calibration curve and standards.

## REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22  
Run ID: MA53156  
Methods: SW846 7470A

Time	Sample Description	Element: H Dilution g
14:14	ZZZZZZ	1
14:16	MA53156-ICV1	1 X
14:17	MA53156-ICB1	1 X
14:19	MA53156-CCV1	1 X
14:20	MA53156-CCB1	1 X
14:22	MA53156-CRI1	1 X
14:23	MP35746-MB1	1 X
14:25	MP35746-B1	1 X
14:26	MP35746-S1	1 X
14:28	MP35746-S2	1 X
14:30	JD53458-1F	1 X
14:31	JD53458-3F	1 X
14:33	JD53458-5F	1 X
14:34	JD53458-7F	1 X
14:36	MA53156-CCV2	1 X
14:37	MA53156-CCB2	1 X
14:39	JD53458-9F	1 X
14:40	JD53458-11F	1 X
14:42	JD53458-13F	1 X
14:43	JD53458-15F	1 X
14:44	JD53458-17F	1 X
14:46	JD53458-19F	1 X
14:47	JD53458-21F	1 X
14:49	JD53458-23F	1 X
14:50	MA53156-CCV3	1 X
14:52	MA53156-CCB3	1 X
14:53	JD53458-25F	1 X
14:55	JD53458-27F	1 X
14:56	JD53458-29F	1 X
14:58	JD53458-31F	1 X
14:59	JD53458-33F	1 X
15:01	JD53458-35F	1 X
15:02	JD53458-37F	1 X
		Element: H g

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22 Methods: SW846 7470A  
Run ID: MA53156

Time	Sample Description	Element: H Dilution g
15:04	JD53458-39F	1 X
15:05	MA53156-CCV4	1 X
15:06	MA53156-CCB4	1 X
15:08	MA53156-CRI2	1 X
15:10	MA53156-CCV5	1 X
15:11	MA53156-CCB5	1 X
15:13	MP35747-MB1	1 X
15:14	MP35747-B1	1 X
15:16	MP35747-S1	1 X
15:17	MP35747-S2	1 X
15:19	DA49817-1	1 X (a)
15:20	MA53156-CCV6	1 X
15:22	MA53156-CCB6	1 X
15:34	MP35748-MB1	1 X
15:36	MP35748-B1	1 X
15:37	MP35748-S1	1 X
15:39	MP35748-S2	1 X
15:41	JD53325-1	1 X (a)
15:42	ZZZZZZ	1
15:44	MA53156-CCV7	1 X
15:45	MA53156-CCB7	1 X
15:47	ZZZZZZ	1
15:48	ZZZZZZ	1
15:50	ZZZZZZ	1
15:51	ZZZZZZ	1
15:52	ZZZZZZ	1
15:54	ZZZZZZ	1
15:55	MA53156-CCV8	1 X
15:57	MA53156-CCB8	1 X
15:58	ZZZZZZ	1
16:00	ZZZZZZ	1
16:01	ZZZZZZ	1
16:03	ZZZZZZ	1
		Element: H g

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/14/22 Methods: SW846 7470A  
Run ID: MA53156

Time	Sample Description	Element: Hg	Dilution g
16:04	ZZZZZZ	1	
16:05	ZZZZZZ	1	
16:09	ZZZZZZ	1	
16:11	MA53156-CCV9	1	X
16:12	MA53156-CCB9	1	X
16:14	MP35749-MB1	1	X
16:15	MP35749-B1	1	X
16:16	MP35749-S1	1	X
16:18	MP35749-S2	1	X
16:20	JD53319-1	1	X (a)
16:22	ZZZZZZ	1	
16:23	MA53156-CCV10	1	X
16:24	MA53156-CCB10	1	X
16:26	ZZZZZZ	1	
16:28	ZZZZZZ	1	
16:29	ZZZZZZ	1	
16:30	ZZZZZZ	1	
16:32	ZZZZZZ	1	
16:33	ZZZZZZ	1	
16:35	MA53156-CCV11	1	X
16:36	MA53156-CCB11	1	X
16:38	ZZZZZZ	1	
16:39	ZZZZZZ	1	
16:40	ZZZZZZ	1	
16:42	ZZZZZZ	1	
16:43	ZZZZZZ	1	
16:45	ZZZZZZ	1	
16:46	MA53156-CCV12	1	X
16:48	MA53156-CCB12	1	X
16:49	MP35765-MB1	1	X
16:51	MP35765-B1	1	X
16:52	MP35765-S1	1	X
16:54	MP35765-S2	1	X
		Element: Hg	

# REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
Analyst: LM Run ID: MA53156  
Parameters: Hg

Time	Sample Description	Element: H Dilution g
16:55	JD53513-1A	1 X (a)
16:57	ZZZZZZ	1
16:59	ZZZZZZ	1
17:00	ZZZZZZ	1
17:01	MA53156-CCV13	1 X
17:03	MA53156-CCB13	1 X
17:05	ZZZZZZ	1
17:06	ZZZZZZ	1
17:07	ZZZZZZ	1
17:09	ZZZZZZ	1
17:10	ZZZZZZ	1
17:12	ZZZZZZ	1
17:13	ZZZZZZ	1
17:15	ZZZZZZ	1
17:16	MA53156-CCV14	1 X
17:17	MA53156-CCB14	1 X
17:19	ZZZZZZ	1
17:21	ZZZZZZ	1
17:22	ZZZZZZ	1
17:23	ZZZZZZ	1
17:25	ZZZZZZ	1
17:26	ZZZZZZ	1
17:28	ZZZZZZ	1
17:29	ZZZZZZ	1
17:31	MA53156-CCV15	1 X
17:32	MA53156-CCB15	1 X
17:34	MP35767-MB1	1 X
17:35	MP35767-B1	1 X
17:37	MP35767-S1	1 X
17:39	MP35767-S2	1 X
17:40	JD53513-21A	1 X (a)
17:42	ZZZZZZ	1
17:43	ZZZZZZ	1
		Element: H g

# REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
Analyst: LM Run ID: MA53156  
Parameters: Hg

Time	Sample Description	Element: Hg	Dilution	g
17:45	MA53156-CCV16	1	X	
17:46	MA53156-CCB16	1	X	
17:48	ZZZZZZ	1		
17:50	ZZZZZZ	1		
17:51	ZZZZZZ	1		
17:52	ZZZZZZ	1		
17:54	ZZZZZZ	1		
17:55	ZZZZZZ	1		
17:57	ZZZZZZ	1		
17:58	MA53156-CCV17	1	X	
18:00	MA53156-CCB17	1	X	
18:02	MP35767-MB1	1		
18:03	MA53156-CCV18	1	X	
18:05	MA53156-CCB18	1	X	

(a) Sample used for QC only; not part of login JD53458.

Element: Hg

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
QC Limits: result < RL Run ID: MA53156 Units: ug/l

Time: Sample ID:		14:17 ICB1		14:20 CCB1		14:37 CCB2		14:52 CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.024	-0.0148	<0.20	-0.0633	<0.20	-0.0563	<0.20	-0.0824	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.2  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV      Date Analyzed: 10/14/22      Methods: SW846 7470A  
QC Limits: result < RL      Run ID: MA53156      Units: ug/l

Time:		15:06		15:11		
Sample ID:		CCB4		CCB5		
Metal	RL	IDL	raw	final	raw	final
Mercury	0.20	.024	-0.0236	<0.20	-0.0344	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV      Date Analyzed: 10/14/22      Methods: SW846 7470A  
QC Limits: 90 to 110 % Recovery      Run ID: MA53156      Units: ug/l

Time:		14:16		14:19		14:36	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Mercury	3	3.10	103.3	2.5	2.56	102.4	2.5
							2.44
							97.6

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.3

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV      Date Analyzed: 10/14/22      Methods: SW846 7470A  
QC Limits: 90 to 110 % Recovery      Run ID: MA53156      Units: ug/l

Time:		14:50		15:05		15:10	
Sample ID:	CCV	CCV3	CCV	CCV4	CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True
Mercury	2.5	2.42	96.8	2.5	2.38	95.2	2.5
							2.40
							96.0

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.3

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: H8101422W1.CSV Date Analyzed: 10/14/22 Methods: SW846 7470A  
 QC Limits: 70 to 130 % Recovery Run ID: MA53156 Units: ug/l

Time:			14:22		15:08	
Sample ID:	CRI	CRIA	CRI1		CRI2	
Metal	True	True	Results	% Rec	Results	% Rec
Mercury	0.20		0.226	113.0	0.208	104.0

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.4  
6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
Analyst: LM Run ID: MA53169  
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:19	MA53169-STD1	1		b=9.0996e-005,c=3.0006e-002,rho=0.9999324
11:20	MA53169-STD2	1		STDB
11:22	MA53169-STD3	1		STDC
11:23	MA53169-STD4	1		STDD
11:25	MA53169-STD5	1		STDE
11:27	MA53169-STD6	1		STDF
11:29	ZZZZZZ	1		
11:31	MA53169-ICV1	1		
11:32	MA53169-ICB1	1		
11:34	MA53169-CCV1	1		
11:35	MA53169-CCB1	1		
11:37	MA53169-CRI1	1		
11:38	MP35806-MB1	1		
11:40	MP35806-B1	1		
11:41	ZZZZZZ	1		
11:43	MA53169-CCV2	1		
11:44	MA53169-CCB2	1		
11:46	MP35807-MB1	1		
11:48	MP35807-B1	1		
11:49	MP35807-S1	1		
11:51	MP35807-S2	1		
11:53	MP35807-LC1	50		
11:55	JD53458-2	1		
11:56	MA53169-CCV3	1		
11:58	MA53169-CCB3	1		
12:00	JD53458-4	1		
12:01	JD53458-6	1		
12:03	JD53458-8	1		
12:05	JD53458-10	1		
12:07	JD53458-12	1		
12:09	JD53458-14	1		
12:11	JD53458-16	1		
12:12	MA53169-CCV4	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/18/22      Methods: SW846 7471B  
Run ID: MA53169

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:14	MA53169-CCB4	1		
12:16	JD53458-18	1		
12:17	JD53458-20	1		
12:24	JD53458-22	1		
12:25	JD53458-24	1		
12:27	JD53458-26	1		
12:29	JD53458-28	1		
12:31	ZZZZZZ	1		
12:33	MA53169-CCV5	1		
12:36	MA53169-CCB5	1		
12:38	JD53458-30	1		
12:39	JD53458-32	1		
12:41	JD53458-34	1		
12:43	JD53458-36	1		
12:44	JD53458-38	1		
12:46	JD53458-40	1		
12:48	MA53169-CCV6	1		
12:50	MA53169-CCB6	1		
12:52	MP35808-MB1	1		
12:53	MP35808-B1	1		
12:55	MP35808-S1	1		
12:57	MP35808-S2	1		
12:58	JD53549-1	1		(sample used for QC only; not part of login JD53458)
13:00	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:04	ZZZZZZ	1		
13:05	MA53169-CCV7	1		
13:07	MA53169-CCB7	1		
13:27	ZZZZZZ	1		
13:28	ZZZZZZ	1		
13:30	ZZZZZZ	1		
13:31	ZZZZZZ	1		
13:33	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
Analyst: LM Run ID: MA53169  
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:34	ZZZZZZ	1		
13:36	ZZZZZZ	1		
13:38	ZZZZZZ	1		
13:39	MA53169-CCV8	1		
13:41	MA53169-CCB8	1		
13:43	ZZZZZZ	1		
13:44	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:47	ZZZZZZ	1		
13:49	ZZZZZZ	1		
13:50	ZZZZZZ	1		
13:52	ZZZZZZ	1		
13:54	ZZZZZZ	1		
13:55	MA53169-CCV9	1		
13:57	MA53169-CCB9	1		
13:58	MP35809-MB1	1		
14:00	MP35809-B1	1		
14:07	MP35809-S1	1		
14:08	MP35809-S2	1		
14:10	JD53602-3	1		(sample used for QC only; not part of login JD53458)
14:12	ZZZZZZ	1		
14:13	ZZZZZZ	1		
14:15	MA53169-CCV10	1		
14:17	MA53169-CCB10	1		
14:18	ZZZZZZ	1		
14:20	ZZZZZZ	1		
14:22	ZZZZZZ	1		
14:23	ZZZZZZ	1		
14:25	ZZZZZZ	1		
14:26	ZZZZZZ	1		
14:28	ZZZZZZ	1		
14:30	ZZZZZZ	1		
14:31	MA53169-CCV11	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/18/22  
Run ID: MA53169  
Methods: SW846 7471B

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:33	MA53169-CCB11	1		
14:35	ZZZZZZ	1		
14:36	ZZZZZZ	1		
14:38	ZZZZZZ	1		
14:39	ZZZZZZ	1		
14:41	ZZZZZZ	1		
14:43	ZZZZZZ	1		
14:44	ZZZZZZ	1		
14:46	ZZZZZZ	1		
14:47	MA53169-CCV12	1		
14:49	MA53169-CCB12	1		
15:21	MP35807-S1	5		
15:22	MP35807-S2	50		
15:24	JD53458-2	5		
15:26	JD53458-4	50		
15:27	JD53458-6	5		
15:29	JD53458-8	5		
15:31	JD53458-10	50		
15:33	JD53458-12	50		
15:34	MA53169-CCV13	1		
15:36	MA53169-CCB13	1		
15:55	JD53458-14	50		
15:57	JD53458-16	50		
15:58	JD53458-18	50		
16:00	JD53458-20	50		
16:02	JD53458-22	50		
16:04	JD53458-24	50		
16:05	JD53458-26	50		
16:07	JD53458-28	50		
16:09	MA53169-CCV14	1		
16:11	MA53169-CCB14	1		
16:12	JD53458-30	50		
16:14	JD53458-32	50		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/18/22      Methods: SW846 7471B  
Run ID: MA53169

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:15	JD53458-34	50		
16:17	JD53458-36	50		
16:19	JD53458-38	50		
16:21	JD53458-40	50		
16:22	ZZZZZZ	2		
16:24	MA53169-CCV15	1		
16:26	MA53169-CCB15	1		
16:29	JD53458-20	200		
16:31	JD53458-22	200		
----->	Last reportable sample/prep for job JD53458			
16:35	MA53169-CCV16	1		
16:37	MA53169-CCB16	1		
16:39	MA53169-CRI2	1		
16:46	MA53169-CCV17	1		
16:48	MA53169-CCB17	1		
----->	Last reportable CCB for job JD53458			
	Refer to raw data for calibration curve and standards.			



REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
 Analyst: LM  
 Parameters: Hg

Date Analyzed: 10/18/22 Methods: SW846 7471B  
 Run ID: MA53169

Time	Sample Description	Element: H Dilution g
11:29	ZZZZZZ	1
11:31	MA53169-ICV1	1 X
11:32	MA53169-ICB1	1 X
11:34	MA53169-CCV1	1 X
11:35	MA53169-CCB1	1 X
11:37	MA53169-CRI1	1 X
11:38	MP35806-MB1	1 X
11:40	MP35806-B1	1 X
11:41	ZZZZZZ	1
11:43	MA53169-CCV2	1 X
11:44	MA53169-CCB2	1 X
11:46	MP35807-MB1	1 X
11:48	MP35807-B1	1 X
11:49	MP35807-S1	1
11:51	MP35807-S2	1
11:53	MP35807-LC1	50 X
11:55	JD53458-2	1
11:56	MA53169-CCV3	1 X
11:58	MA53169-CCB3	1 X
12:00	JD53458-4	1
12:01	JD53458-6	1
12:03	JD53458-8	1
12:05	JD53458-10	1
12:07	JD53458-12	1
12:09	JD53458-14	1
12:11	JD53458-16	1
12:12	MA53169-CCV4	1 X
12:14	MA53169-CCB4	1 X
12:16	JD53458-18	1
12:17	JD53458-20	1
12:24	JD53458-22	1
12:25	JD53458-24	1
12:27	JD53458-26	1
		Element: H g

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/18/22 Methods: SW846 7471B  
Run ID: MA53169

Time	Sample Description	Element: Hg	Dilution	g
12:29	JD53458-28	1		
12:31	ZZZZZZ	1		
12:33	MA53169-CCV5	1	X	
12:36	MA53169-CCB5	1	X	
12:38	JD53458-30	1		
12:39	JD53458-32	1		
12:41	JD53458-34	1		
12:43	JD53458-36	1		
12:44	JD53458-38	1		
12:46	JD53458-40	1		
12:48	MA53169-CCV6	1	X	
12:50	MA53169-CCB6	1	X	
12:52	MP35808-MB1	1	X	
12:53	MP35808-B1	1	X	
12:55	MP35808-S1	1	X	
12:57	MP35808-S2	1	X	
12:58	JD53549-1	1	X (a)	
13:00	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:04	ZZZZZZ	1		
13:05	MA53169-CCV7	1	X	
13:07	MA53169-CCB7	1	X	
13:27	ZZZZZZ	1		
13:28	ZZZZZZ	1		
13:30	ZZZZZZ	1		
13:31	ZZZZZZ	1		
13:33	ZZZZZZ	1		
13:34	ZZZZZZ	1		
13:36	ZZZZZZ	1		
13:38	ZZZZZZ	1		
13:39	MA53169-CCV8	1	X	
13:41	MA53169-CCB8	1	X	
13:43	ZZZZZZ	1		
		Element: Hg		

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
 Analyst: LM  
 Parameters: Hg

Date Analyzed: 10/18/22 Methods: SW846 7471B  
 Run ID: MA53169

Time	Sample Description	Element: H Dilution g
13:44	ZZZZZZ	1
13:46	ZZZZZZ	1
13:47	ZZZZZZ	1
13:49	ZZZZZZ	1
13:50	ZZZZZZ	1
13:52	ZZZZZZ	1
13:54	ZZZZZZ	1
13:55	MA53169-CCV9	1 X
13:57	MA53169-CCB9	1 X
13:58	MP35809-MB1	1 X
14:00	MP35809-B1	1 X
14:07	MP35809-S1	1 X
14:08	MP35809-S2	1 X
14:10	JD53602-3	1 X (a)
14:12	ZZZZZZ	1
14:13	ZZZZZZ	1
14:15	MA53169-CCV10	1 X
14:17	MA53169-CCB10	1 X
14:18	ZZZZZZ	1
14:20	ZZZZZZ	1
14:22	ZZZZZZ	1
14:23	ZZZZZZ	1
14:25	ZZZZZZ	1
14:26	ZZZZZZ	1
14:28	ZZZZZZ	1
14:30	ZZZZZZ	1
14:31	MA53169-CCV11	1 X
14:33	MA53169-CCB11	1 X
14:35	ZZZZZZ	1
14:36	ZZZZZZ	1
14:38	ZZZZZZ	1
14:39	ZZZZZZ	1
14:41	ZZZZZZ	1
		Element: H g

# REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
Analyst: LM  
Parameters: Hg

Date Analyzed: 10/18/22 Methods: SW846 7471B  
Run ID: MA53169

Time	Sample Description	Element: Hg Dilution g
14:43	ZZZZZZ	1
14:44	ZZZZZZ	1
14:46	ZZZZZZ	1
14:47	MA53169-CCV12	1 X
14:49	MA53169-CCB12	1 X
15:21	MP35807-S1	5 X
15:22	MP35807-S2	50 X
15:24	JD53458-2	5 X
15:26	JD53458-4	50 X
15:27	JD53458-6	5 X
15:29	JD53458-8	5 X
15:31	JD53458-10	50 X
15:33	JD53458-12	50 X
15:34	MA53169-CCV13	1 X
15:36	MA53169-CCB13	1 X
15:55	JD53458-14	50 X
15:57	JD53458-16	50 X
15:58	JD53458-18	50 X
16:00	JD53458-20	50
16:02	JD53458-22	50
16:04	JD53458-24	50 X
16:05	JD53458-26	50 X
16:07	JD53458-28	50 X
16:09	MA53169-CCV14	1 X
16:11	MA53169-CCB14	1 X
16:12	JD53458-30	50 X
16:14	JD53458-32	50 X
16:15	JD53458-34	50 X
16:17	JD53458-36	50 X
16:19	JD53458-38	50 X
16:21	JD53458-40	50 X
16:22	ZZZZZZ	2
16:24	MA53169-CCV15	1 X
		Element: Hg

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV  
 Analyst: LM  
 Parameters: Hg

Date Analyzed: 10/18/22  
 Run ID: MA53169  
 Methods: SW846 7471B

Time	Sample Description	Dilution	Element: Hg
16:26	MA53169-CCB15	1	X
16:29	JD53458-20	200	X
16:31	JD53458-22	200	X
16:35	MA53169-CCV16	1	X
16:37	MA53169-CCB16	1	X
16:39	MA53169-CRI2	1	X
16:46	MA53169-CCV17	1	X
16:48	MA53169-CCB17	1	X

(a) Sample used for QC only; not part of login JD53458.

Element: Hg

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: result < RL      Run ID: MA53169      Units: ug/l

Time:		11:32		11:35		11:44		11:58		
Sample ID:		ICB1		CCB1		CCB2		CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.024	-0.0345	<0.20	-0.0666	<0.20	-0.0318	<0.20	-0.0485	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
QC Limits: result < RL Run ID: MA53169 Units: ug/l

Time: Sample ID:			12:14 CCB4		12:36 CCB5		12:50 CCB6		13:07 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.024	-0.103	<0.20	-0.0460	<0.20	-0.138	<0.20	-0.0243	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
QC Limits: result < RL Run ID: MA53169 Units: ug/l

Time:		13:41		13:57		14:17		14:33		
Sample ID:		CCB8		CCB9		CCB10		CCB11		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.024	-0.0195	<0.20	-0.0369	<0.20	-0.0318	<0.20	-0.0255	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
QC Limits: result < RL Run ID: MA53169 Units: ug/l

Time:			14:49		15:36		16:11		16:26	
Sample ID:			CCB12		CCB13		CCB14		CCB15	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.024	-0.0442	<0.20	-0.0355	<0.20	-0.0485	<0.20	-0.0313	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: result < RL      Run ID: MA53169      Units: ug/l

Time:		16:37		16:48		
Sample ID:		CCB16		CCB17		
Metal	RL	IDL	raw	final	raw	final
Mercury	0.20	.024	-0.00200	<0.20	0.00460	<0.20

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery      Run ID: MA53169      Units: ug/l

Time:		11:31			11:34			11:43		
Sample ID:	ICV	ICV1	CCV		CCV1	CCV		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Mercury	3	3.12	104.0	2.5	2.54	101.6	2.5	2.53	101.2	

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery      Run ID: MA53169      Units: ug/l

Time:		11:56			12:12			12:33		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Mercury	2.5	2.45	98.0	2.5	2.27	90.8	2.5	2.43	97.2	

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery      Run ID: MA53169      Units: ug/l

Time:		12:48		13:05		13:39	
Sample ID:		CCV		CCV		CCV	
		CCV6		CCV7		CCV8	
Metal		True	Results % Rec	True	Results % Rec	True	Results % Rec
Mercury		2.5	2.31 92.4	2.5	2.51 100.4	2.5	2.45 98.0

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery      Run ID: MA53169      Units: ug/l

Time:		13:55			14:15			14:31		
Sample ID:	CCV	CCV9		CCV	CCV10		CCV	CCV11		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Mercury	2.5	2.47	98.8	2.5	2.53	101.2	2.5	2.47	98.8	

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV      Date Analyzed: 10/18/22      Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery      Run ID: MA53169      Units: ug/l

Time:		14:47			15:34			16:09		
Sample ID:	CCV	CCV12		CCV	CCV13		CCV	CCV14		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Mercury	2.5	2.54	101.6	2.5	2.49	99.6	2.5	2.47	98.8	

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
QC Limits: 90 to 110 % Recovery Run ID: MA53169 Units: ug/l

Time:		16:24			16:35			16:46		
Sample ID:	CCV	CCV15		CCV	CCV16		CCV	CCV17		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Mercury	2.5	2.52	100.8	2.5	2.60	104.0	2.5	2.60	104.0	

(\*) Outside of QC limits  
(anr) Analyte not requested



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: H8101822S1.CSV Date Analyzed: 10/18/22 Methods: SW846 7471B  
 QC Limits: 70 to 130 % Recovery Run ID: MA53169 Units: ug/l

Time:			11:37		16:39	
Sample ID:	CRI	CRIA	CRI1		CRI2	
Metal	True	True	Results	% Rec	Results	% Rec
Mercury	0.20		0.188	94.0	0.201	100.5

(\*) Outside of QC limits  
 (anr) Analyte not requested

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:46	MA53188-STD1	1		STDA
07:51	MA53188-STD2	1		STDB
07:56	MA53188-ICV1	1		
08:04	MA53188-ICB1	1		
08:09	MA53188-CRID1	1		
08:14	MA53188-ICCV1	1		
08:24	MA53188-CCB1	1		
08:30	MA53188-CRID2	1		
08:34	MA53188-CRI1	1		
08:39	MA53188-ICSA1	1		
08:44	MA53188-ICSAB1	1		
08:49	MA53188-HSTD1	1		
08:55	MA53188-HSTD2	1		
09:00	ZZZZZZ	1		
09:05	ZZZZZZ	1		
09:10	ZZZZZZ	1		
09:15	MA53188-CCV1	1		
09:20	MA53188-CCB2	1		
09:25	MA53188-CRID3	1		
09:30	ZZZZZZ	1		
09:34	ZZZZZZ	1		
09:39	ZZZZZZ	1		
09:44	MP35804-MB1	1		
09:49	MP35804-B1	1		
09:54	MP35804-S1	1		
09:59	MP35804-S2	1		
10:04	MA53188-CCV2	1		
10:09	MA53188-CCB3	1		
10:14	JD53498-1	1		(sample used for QC only; not part of login JD53458)
10:18	MP35804-SD1	5		
10:23	ZZZZZZ	1		
10:28	ZZZZZZ	1		
10:33	MP35763-MB2	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:38	MP35763-B2	1		
10:43	MP35763-S1	1		
10:48	MP35763-S2	1		
10:53	JD53322-1	1		(sample used for QC only; not part of login JD53458)
10:58	MA53188-CCV3	1		
11:02	MA53188-CCB4	1		
11:07	MP35763-SD1	5		
11:12	MP35804-MB1	1		
11:17	MP35804-B1	1		
11:22	MP35804-S1	1		
11:27	MP35804-S2	1		
11:32	MP35821-MB1	1		
11:36	MP35821-B1	1		
11:41	MP35821-S1	1		Ca, AS,S high
11:46	MP35821-S2	1		Ca, AS,S high
11:51	ZZZZZZ	1		
11:56	MA53188-CCV4	1		
12:01	MA53188-CCB5	1		
12:06	ZZZZZZ	1		
12:11	JD53458-39F	1		Ca, AS,S high
12:16	MP35821-SD1	5		Ca, AS,S high
12:21	JD53458-35F	1		AS,S high
12:26	JD53458-37F	1		AS,S high
12:31	MP35770-B1	1		
12:36	MP35770-MB1	1		rerun for AS, Sunnocco
12:41	MP35770-B2	1		
12:45	MA53188-CCV5	1		
12:50	MA53188-CCB6	1		
12:55	MP35770-S1	1		
13:00	MP35770-S2	1		
13:05	JD53407-2F	1		(sample used for QC only; not part of login JD53458)
13:10	MP35770-SD1	5		
13:15	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:20	ZZZZZZ	1		
13:25	JD53458-1F	1		S high
13:30	JD53458-3F	1		S high
13:35	JD53458-5F	1		S high
13:40	MA53188-CCV6	1		
13:45	MA53188-CCB7	1		
13:50	JD53458-7F	1		S high
13:55	JD53458-9F	1		S high
14:00	JD53458-11F	1		S high
14:06	JD53458-13F	1		S high
14:11	JD53458-15F	1		S high
14:16	JD53458-17F	1		AS, S high
14:21	JD53458-19F	1		AS, S high
14:26	JD53458-21F	1		AS, S high
14:31	MA53188-CCV7	1		
14:36	MA53188-CCB8	1		
14:41	JD53458-23F	1		AS, S high
14:46	JD53458-25F	1		AS, S high
14:52	JD53458-27F	1		AS, S high
14:57	JD53458-29F	1		AS, S high
15:02	JD53458-31F	1		AS high
15:07	JD53458-33F	1		As, S high
----->	Last reportable sample/prep for job JD53458			
15:12	MA53188-CCV8	1		
15:17	MA53188-CCB9	1		
15:22	MA53188-CRID4	1		
15:27	MA53188-CRI2	1		
15:32	MA53188-ICSA2	1		
15:37	MA53188-ICSAB2	1		
15:41	MA53188-CCV9	1		
15:46	MA53188-CCB10	1		
----->	Last reportable CCB for job JD53458			
15:51	MP35770-MB1	1		
15:56	ZZZZZZ	1		
16:01	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:06	ZZZZZZ	1		
16:11	ZZZZZZ	1		
16:16	ZZZZZZ	1		
16:21	MA53188-CCV10	1		
16:26	MA53188-CCB11	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	Sb	As	Cd	Co	Cu	Fe	Pb	Mn	Ni	Se	Ag	Tl	Zn
07:56	MA53188-ICV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:04	MA53188-ICB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:09	MA53188-CRID1	1													
08:14	MA53188-ICCV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:24	MA53188-CCB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:30	MA53188-CRID2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:34	MA53188-CRI1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:39	MA53188-ICSA1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:44	MA53188-ICSAB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:49	MA53188-HSTD1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:55	MA53188-HSTD2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:00	ZZZZZZ	1													
09:05	ZZZZZZ	1													
09:10	ZZZZZZ	1													
09:15	MA53188-CCV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:20	MA53188-CCB2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:25	MA53188-CRID3	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:30	ZZZZZZ	1													
09:34	ZZZZZZ	1													
09:39	ZZZZZZ	1													
09:44	MP35804-MB1	1													
09:49	MP35804-B1	1													
09:54	MP35804-S1	1													
09:59	MP35804-S2	1													
10:04	MA53188-CCV2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:09	MA53188-CCB3	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:14	JD53498-1	1		X	X		X		X	X	X			X	(a)
10:18	MP35804-SD1	5		X	X		X		X	X	X			X	
10:23	ZZZZZZ	1													
10:28	ZZZZZZ	1													
10:33	MP35763-MB2	1												X	
10:38	MP35763-B2	1												X	
10:43	MP35763-S1	1												X	
Element:			Sb	As	Cd	Co	Cu	Fe	Pb	Mn	Ni	Se	Ag	Tl	Zn

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S	A	C	C	F	P	M	N	S	A	T	Z		
			b	s	d	o	u	e	b	n	i	e	g	l	n	
10:48	MP35763-S2	1											X			
10:53	JD53322-1	1											X	(a)		
10:58	MA53188-CCV3	1		X	X	X	X	X	X	X	X	X	X	X	X	
11:02	MA53188-CCB4	1		X	X	X	X	X	X	X	X	X	X	X	X	
11:07	MP35763-SD1	5											X			
11:12	MP35804-MB1	1			X	X		X		X	X	X		X		
11:17	MP35804-B1	1			X	X		X		X	X	X		X		
11:22	MP35804-S1	1			X	X		X		X	X	X		X		
11:27	MP35804-S2	1			X	X		X		X	X	X		X		
11:32	MP35821-MB1	1		X	X	X	X	X	X	X	X	X	X	X	X	
11:36	MP35821-B1	1		X	X	X	X	X	X	X	X	X	X	X	X	
11:41	MP35821-S1	1					X	X	X		X	X		X		
11:46	MP35821-S2	1					X	X	X		X	X		X		
11:51	ZZZZZZ	1														
11:56	MA53188-CCV4	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:01	MA53188-CCB5	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:06	ZZZZZZ	1														
12:11	JD53458-39F	1					X	X	X		X	X		X		
12:16	MP35821-SD1	5					X	X	X		X	X		X		
12:21	JD53458-35F	1					X	X	X		X	X		X		
12:26	JD53458-37F	1					X	X	X		X	X		X		
12:31	MP35770-B1	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:36	MP35770-MB1	1		X		X	X	X	X	X	X	X	X	X	X	
12:41	MP35770-B2	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:45	MA53188-CCV5	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:50	MA53188-CCB6	1		X	X	X	X	X	X	X	X	X	X	X	X	
12:55	MP35770-S1	1		X	X	X	X	X	X	X	X	X	X	X	X	
13:00	MP35770-S2	1		X	X	X	X	X	X	X	X	X	X	X	X	
13:05	JD53407-2F	1							X					(a)		
13:10	MP35770-SD1	5		X	X	X	X	X	X	X	X	X	X	X	X	
13:15	ZZZZZZ	1														
13:20	ZZZZZZ	1														
13:25	JD53458-1F	1		X	X	X	X	X	X	X	X	X	X	X	X	
		Element:	S	A	C	C	F	P	M	N	S	A	T	Z		
			b	s	d	o	u	e	b	n	i	e	g	l	n	

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	F u	P e	M b	N i	S e	A g	T l	Z n
13:30	JD53458-3F	1		X	X	X	X	X	X	X	X	X	X	X
13:35	JD53458-5F	1		X	X	X	X	X	X	X	X	X	X	X
13:40	MA53188-CCV6	1	X	X	X	X	X	X	X	X	X	X	X	X
13:45	MA53188-CCB7	1	X	X	X	X	X	X	X	X	X	X	X	X
13:50	JD53458-7F	1		X	X	X	X	X	X	X	X	X	X	X
13:55	JD53458-9F	1		X	X	X	X	X	X	X	X	X	X	X
14:00	JD53458-11F	1		X	X	X	X	X	X	X	X	X	X	X
14:06	JD53458-13F	1		X	X	X	X	X	X	X	X	X	X	X
14:11	JD53458-15F	1		X	X	X	X	X	X	X	X	X	X	X
14:16	JD53458-17F	1				X	X	X	X	X	X	X	X	X
14:21	JD53458-19F	1				X	X	X	X	X	X	X	X	X
14:26	JD53458-21F	1				X	X	X	X	X	X	X	X	X
14:31	MA53188-CCV7	1	X	X	X	X	X	X	X	X	X	X	X	X
14:36	MA53188-CCB8	1	X	X	X	X	X	X	X	X	X	X	X	X
14:41	JD53458-23F	1				X	X	X	X	X	X	X	X	X
14:46	JD53458-25F	1				X	X	X	X	X	X	X	X	X
14:52	JD53458-27F	1				X	X	X	X	X	X	X	X	X
14:57	JD53458-29F	1				X	X	X	X	X	X	X	X	X
15:02	JD53458-31F	1	X			X	X	X	X	X	X	X	X	X
15:07	JD53458-33F	1				X	X	X	X	X	X	X	X	X
15:12	MA53188-CCV8	1	X	X	X	X	X	X	X	X	X	X	X	X
15:17	MA53188-CCB9	1	X	X	X	X	X	X	X	X	X	X	X	X
15:22	MA53188-CRID4	1	X	X	X	X	X	X	X	X	X	X	X	X
15:27	MA53188-CRI2	1	X	X	X	X	X	X	X	X	X	X	X	X
15:32	MA53188-ICSA2	1	X	X	X	X	X	X	X	X	X	X	X	X
15:37	MA53188-ICSAB2	1	X	X	X	X	X	X	X	X	X	X	X	X
15:41	MA53188-CCV9	1	X	X	X	X	X	X	X	X	X	X	X	X
15:46	MA53188-CCB10	1	X	X	X	X	X	X	X	X	X	X	X	X
15:51	MP35770-MB1	1												
15:56	ZZZZZZ	1												
16:01	ZZZZZZ	1												
16:06	ZZZZZZ	1												
16:11	ZZZZZZ	1												
Element:			S b	A s	C d	C o	F u	P e	M b	N i	S e	A g	T l	Z n



REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution	Element: Sb	As	Cd	Co	Cu	Fe	Pb	Mn	Ni	Se	Ag	Tl	Zn
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16:16	ZZZZZZ	1													
16:21	MA53188-CCV10	1	X	X	X	X	X	X	X	X	X	X	X	X	X
16:26	MA53188-CCB11	1	X	X	X	X	X	X	X	X	X	X	X	X	X

(a) Sample used for QC only; not part of login JD53458.

Element: Sb As Cd Co Cu Fe Pb Mn Ni Se Ag Tl Zn

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA53188  
 Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:46	MA53188-STD1	7555 R	182850 R	14267 R	12390 R
07:51	MA53188-STD2	7300	171820	14292	11118
07:56	MA53188-ICV1	7504	176680	14034	11526
08:04	MA53188-ICB1	7592	181050	14299	12470
08:09	MA53188-CRID1	No results reported for the elements associated with this internal standard.			
08:14	MA53188-ICCV1	7473	174640	14240	11514
08:24	MA53188-CCB1	7622	182400	14302	12531
08:30	MA53188-CRID2	7630	182420	14379	12531
08:34	MA53188-CRI1	7602	177610	14226	12376
08:39	MA53188-ICSA1	6944	162420	14086	10357
08:44	MA53188-ICSAB1	6996	162670	14180	10437
08:49	MA53188-HSTD1	7594	178900	14619	12406
08:55	MA53188-HSTD2	7034	166180	14206	10469
09:00	ZZZZZZ	7616	181910	14496	12571
09:05	ZZZZZZ	7561	185060	14581	12696
09:10	ZZZZZZ	7726	182550	14445	12720
09:15	MA53188-CCV1	7442	178100	14500	11536
09:20	MA53188-CCB2	7727	999999 !a	14492	12755
09:25	MA53188-CRID3	7718	185110	14591	12692
09:30	ZZZZZZ	7660	180750	14615	12517
09:34	ZZZZZZ	7486	179520	14200	12573
09:39	ZZZZZZ	7407	177650	14074	12441
09:44	MP35804-MB1	No results reported for the elements associated with this internal standard.			
09:49	MP35804-B1	No results reported for the elements associated with this internal standard.			
09:54	MP35804-S1	No results reported for the elements associated with this internal standard.			
09:59	MP35804-S2	No results reported for the elements associated with this internal standard.			
10:04	MA53188-CCV2	7472	179860	14678	11563
10:09	MA53188-CCB3	7768	187250	14522	12798
10:14	JD53498-1	7354	178850	14785	11664
10:18	MP35804-SD1	7757	186960	14717	12563
10:23	ZZZZZZ	7373	175930	14314	11763
10:28	ZZZZZZ	7348	175960	14245	11869
10:33	MP35763-MB2	7534	180930	14488	12587

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:38	MP35763-B2	7461	177590	14583	11823
10:43	MP35763-S1	7469	175870	14624	11657
10:48	MP35763-S2	7360	175160	14593	11515
10:53	JD53322-1	7513	178420	14740	12143
10:58	MA53188-CCV3	7616	182740	14752	11738
11:02	MA53188-CCB4	7799	189800	14639	12812
11:07	MP35763-SD1	7827	189470	15058	12767
11:12	MP35804-MB1	7884	191780	15117	12970
11:17	MP35804-B1	7704	183900	14749	12176
11:22	MP35804-S1	7675	181110	15351	11914
11:27	MP35804-S2	7614	178090	15327	11751
11:32	MP35821-MB1	7884	192600	15385	12962
11:36	MP35821-B1	7866	188470	15082	12310
11:41	MP35821-S1	7418	172950	15180	11265
11:46	MP35821-S2	7446	177330	15212	11294
11:51	ZZZZZZ	7863	189660	15049	13058
11:56	MA53188-CCV4	7773	187270	15174	11939
12:01	MA53188-CCB5	7868	193350	15310	12905
12:06	ZZZZZZ	7580	182300	15057	11783
12:11	JD53458-39F	7499	181550	15325	11448
12:16	MP35821-SD1	7660	189690	15377	12203
12:21	JD53458-35F	7100	171990	15049	10522
12:26	JD53458-37F	7364	179810	15253	11168
12:31	MP35770-B1	7887	189560	15501	12274
12:36	MP35770-MB1	8135	182790	15560	13310
12:41	MP35770-B2	7935	191400	15651	12354
12:45	MA53188-CCV5	7836	185630	15391	12033
12:50	MA53188-CCB6	8125	192740	15422	13234
12:55	MP35770-S1	7717	185270	15497	11534
13:00	MP35770-S2	7667	183010	15455	11428
13:05	JD53407-2F	7705	184980	15378	11675
13:10	MP35770-SD1	7952	192190	15556	12571
13:15	ZZZZZZ	7669	183630	15388	11695

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:20	ZZZZZZ	7664	182380	15049	11375
13:25	JD53458-1F	7684	185870	15659	11627
13:30	JD53458-3F	7683	185150	15518	11614
13:35	JD53458-5F	7832	188220	15499	11911
13:40	MA53188-CCV6	8052	191730	15852	12308
13:45	MA53188-CCB7	8194	198880	15734	13356
13:50	JD53458-7F	7793	188520	15609	11828
13:55	JD53458-9F	7230	169530	15350	10517
14:00	JD53458-11F	7285	174980	15257	10555
14:06	JD53458-13F	7578	183240	15492	11320
14:11	JD53458-15F	7606	184580	15553	11426
14:16	JD53458-17F	7386	178540	15164	10767
14:21	JD53458-19F	7269	175890	15292	10590
14:26	JD53458-21F	7306	174380	14988	10462
14:31	MA53188-CCV7	8107	193020	15728	12373
14:36	MA53188-CCB8	8260	200280	15064	13446
14:41	JD53458-23F	7177	173560	15270	10320
14:46	JD53458-25F	7309	175670	14839	10789
14:52	JD53458-27F	6887	169240	14983	10082
14:57	JD53458-29F	7848	189270	15726	11881
15:02	JD53458-31F	7821	189590	15699	11830
15:07	JD53458-33F	7173	173420	15047	10471
15:12	MA53188-CCV8	8164	194710	15609	12428
15:17	MA53188-CCB9	8263	200470	15698	13423
15:22	MA53188-CRID4	8256	198840	15709	13374
15:27	MA53188-CRI2	8116	196640	15532	13066
15:32	MA53188-ICSA2	7545	177220	15177	11037
15:37	MA53188-ICSAB2	7550	178150	15256	11062
15:41	MA53188-CCV9	8025	191780	15509	12246
15:46	MA53188-CCB10	8276	200100	15506	13435
15:51	MP35770-MB1	No results reported for the elements associated with this internal standard.			
15:56	ZZZZZZ	8214	199150	15468	13340
16:01	ZZZZZZ	8402	203800	15768	13565

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53188  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:06	ZZZZZZ	8393	202100	15807	13616
16:11	ZZZZZZ	8299	200240	15596	13550
16:16	ZZZZZZ	8341	201520	15797	13519
16:21	MA53188-CCV10	7989	192850	15519	12227
16:26	MA53188-CCB11	8148	199020	15492	13305

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

(a) No samples reported for the elements associated with this internal standard.

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:				08:04 ICB1			08:24 CCB1			09:20 CCB2			10:09 CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final	raw	final	raw	final	
Aluminum	200	17	anr												
Antimony	6.0	1.7	-0.200	<6.0	0.700	<6.0	0.500	<6.0	0.00	<6.0					
Arsenic	3.0	2.1	-0.100	<3.0	0.100	<3.0	0.100	<3.0	0.800	<3.0					
Barium	200	.8	anr												
Beryllium	1.0	.3	anr												
Bismuth	20	2.3													
Boron	100	2.3													
Cadmium	3.0	.3	-0.100	<3.0	-0.100	<3.0	0.00	<3.0	0.100	<3.0					
Calcium	5000	6.6	anr												
Cerium	100														
Chromium	10	.3	anr												
Cobalt	50	.4	-0.100	<50	-0.200	<50	-0.200	<50	0.100	<50					
Copper	10	.8	-0.100	<10	0.100	<10	1.30	<10	0.400	<10					
Iron	100	5.3	1.20	<100	2.70	<100	10.0	<100	7.30	<100					
Lead	3.0	1.1	-0.100	<3.0	0.400	<3.0	0.100	<3.0	0.200	<3.0					
Lithium	50	4.8													
Magnesium	5000	32	anr												
Manganese	15	.1	0.00	<15	0.00	<15	0.200	<15	0.200	<15					
Molybdenum	20	.6													
Nickel	10	.4	-0.400	<10	-0.100	<10	-0.100	<10	0.200	<10					
Phosphorus	50	1.2													
Potassium	10000	77	anr												
Selenium	10	3.2	0.600	<10	-0.600	<10	0.900	<10	0.100	<10					
Silicon	200	1.7													
Silver	10	1	0.300	<10	0.200	<10	1.00	<10	1.60	<10					
Sodium	10000	34	anr												
Strontium	10	.3													
Sulfur	50	3													
Thallium	10	1.8	0.500	<10	0.400	<10	1.30	<10	-1.90	<10					
Tin	10	.8													
Titanium	10	.5													
Tungsten	50	2.6													
Vanadium	50	.6	anr												

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:			08:04 ICB1		08:24 CCB1		09:20 CCB2		10:09 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	-0.400	<20	-0.400	<20	-0.200	<20	-0.300	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:			11:02 CCB4		12:01 CCB5		12:50 CCB6		13:45 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	0.500	<6.0	0.500	<6.0	0.600	<6.0	1.00	<6.0
Arsenic	3.0	2.1	0.500	<3.0	1.70	<3.0	0.500	<3.0	0.800	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.00	<3.0	0.00	<3.0	-0.200	<3.0	0.00	<3.0
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	-0.200	<50	-0.200	<50	-0.200	<50	-0.200	<50
Copper	10	.8	0.400	<10	0.700	<10	0.300	<10	0.200	<10
Iron	100	5.3	3.80	<100	2.80	<100	0.800	<100	-0.400	<100
Lead	3.0	1.1	-0.200	<3.0	0.100	<3.0	0.300	<3.0	0.00	<3.0
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	0.100	<15	0.100	<15	0.00	<15	0.00	<15
Molybdenum	20	.6								
Nickel	10	.4	-0.200	<10	0.100	<10	-0.400	<10	-0.300	<10
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	-1.00	<10	-2.20	<10	-0.100	<10	-0.400	<10
Silicon	200	1.7								
Silver	10	1	1.50	<10	1.20	<10	0.500	<10	0.300	<10
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	-0.700	<10	-0.300	<10	-0.500	<10	0.100	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:			11:02 CCB4		12:01 CCB5		12:50 CCB6		13:45 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	-0.200	<20	-0.200	<20	-0.200	<20	-0.200	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:				14:36 CCB8		15:17 CCB9		15:46 CCB10	
Metal	RL	IDL	raw	final	raw	final	raw	final	
Aluminum	200	17	anr						
Antimony	6.0	1.7	0.00	<6.0	1.10	<6.0	0.700	<6.0	
Arsenic	3.0	2.1	2.30	<3.0	2.80	<3.0	1.20	<3.0	
Barium	200	.8	anr						
Beryllium	1.0	.3	anr						
Bismuth	20	2.3							
Boron	100	2.3							
Cadmium	3.0	.3	-0.100	<3.0	0.00	<3.0	-0.300	<3.0	
Calcium	5000	6.6	anr						
Cerium	100								
Chromium	10	.3	anr						
Cobalt	50	.4	-0.200	<50	-0.100	<50	-0.200	<50	
Copper	10	.8	-0.400	<10	-0.200	<10	-0.500	<10	
Iron	100	5.3	1.60	<100	2.40	<100	2.60	<100	
Lead	3.0	1.1	0.400	<3.0	0.600	<3.0	-0.700	<3.0	
Lithium	50	4.8							
Magnesium	5000	32	anr						
Manganese	15	.1	0.00	<15	0.100	<15	0.100	<15	
Molybdenum	20	.6							
Nickel	10	.4	0.00	<10	0.00	<10	-0.300	<10	
Phosphorus	50	1.2							
Potassium	10000	77	anr						
Selenium	10	3.2	0.400	<10	0.700	<10	-1.00	<10	
Silicon	200	1.7							
Silver	10	1	-0.100	<10	0.00	<10	0.200	<10	
Sodium	10000	34	anr						
Strontium	10	.3							
Sulfur	50	3							
Thallium	10	1.8	-0.500	<10	-0.400	<10	-0.500	<10	
Tin	10	.8							
Titanium	10	.5							
Tungsten	50	2.6							
Vanadium	50	.6	anr						

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53188 Units: ug/l

Time: Sample ID:			14:36 CCB8		15:17 CCB9		15:46 CCB10	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc	20	.1	-0.300	<20	-0.300	<20	-0.300	<20
Zirconium	10	.3						
(*) Outside of QC limits								
(anr) Analyte not requested								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA53188 Units: ug/l

Time: Sample ID:		08:14 ICCV1		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	2000	1980	99.0	
Arsenic	2000	1990	99.5	
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	2000	1960	98.0	
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	2000	1930	96.5	
Copper	2000	1930	96.5	
Iron	40000	40200	100.5	
Lead	2000	1930	96.5	
Lithium				
Magnesium	anr			
Manganese	2000	1970	98.5	
Molybdenum				
Nickel	2000	1930	96.5	
Phosphorus				
Potassium	anr			
Selenium	2000	1940	97.0	
Silicon				
Silver	250	249	99.6	
Sodium	anr			
Strontium				
Sulfur				
Thallium	2000	1900	95.0	
Tin				
Titanium				
Tungsten				
Vanadium	anr			

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA53188      Units: ug/l

Time:	08:14
Sample ID: ICCV	ICCV1
Metal	True
Results	% Rec

Zinc      2000      1950      97.5

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.3.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time: Sample ID:		ICV	07:56 ICV1		CCV	09:15 CCV1		CCV	10:04 CCV2	
Metal	True		Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr									
Antimony	2000	1970	98.5	2000	2060	103.0	2000	2020	101.0	
Arsenic	2000	1960	98.0	2000	2080	104.0	2000	2040	102.0	
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	2000	2020	101.0	2000	2050	102.5	2000	1990	99.5	
Calcium	anr									
Cerium										
Chromium	anr									
Cobalt	2000	2000	100.0	2000	2020	101.0	2000	1960	98.0	
Copper	2000	1970	98.5	2000	1990	99.5	2000	1910	95.5	
Iron	40000	40400	101.0	40000	40500	101.3	40000	38900	97.3	
Lead	2000	2000	100.0	2000	2010	100.5	2000	1950	97.5	
Lithium										
Magnesium	anr									
Manganese	2000	2000	100.0	2000	2020	101.0	2000	1930	96.5	
Molybdenum										
Nickel	2000	2000	100.0	2000	2010	100.5	2000	1950	97.5	
Phosphorus										
Potassium	anr									
Selenium	2000	1990	99.5	2000	2040	102.0	2000	2000	100.0	
Silicon										
Silver	250	246	98.4	250	255	102.0	250	247	98.8	
Sodium	anr									
Strontium										
Sulfur										
Thallium	2000	1980	99.0	2000	1990	99.5	2000	2020	101.0	
Tin										
Titanium										
Tungsten										
Vanadium	anr									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time:		07:56		09:15		10:04	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Zinc	2000	2010	100.5	2000	2040	102.0	2000
Zirconium							1980
(*) Outside of QC limits							99.0
(anr) Analyte not requested							

6.3.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time: Sample ID:	CCV	10:58 CCV3		CCV	11:56 CCV4		CCV	12:45 CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	2030	101.5	2000	1980	99.0	2000	1960	98.0
Arsenic	2000	2040	102.0	2000	1980	99.0	2000	1960	98.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	2000	100.0	2000	1950	97.5	2000	1940	97.0
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	2000	1980	99.0	2000	1930	96.5	2000	1920	96.0
Copper	2000	1940	97.0	2000	1880	94.0	2000	1920	96.0
Iron	40000	39300	98.3	40000	38200	95.5	40000	37600	94.0
Lead	2000	1970	98.5	2000	1930	96.5	2000	1920	96.0
Lithium									
Magnesium	anr								
Manganese	2000	1930	96.5	2000	1870	93.5	2000	1900	95.0
Molybdenum									
Nickel	2000	1970	98.5	2000	1930	96.5	2000	1910	95.5
Phosphorus									
Potassium	anr								
Selenium	2000	2020	101.0	2000	1970	98.5	2000	1950	97.5
Silicon									
Silver	250	248	99.2	250	239	95.6	250	243	97.2
Sodium	anr								
Strontium									
Sulfur									
Thallium	2000	2040	102.0	2000	1990	99.5	2000	1980	99.0
Tin									
Titanium									
Tungsten									
Vanadium	anr								



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time:		10:58		11:56		12:45	
Sample ID:	CCV	CCV3	CCV	CCV4	CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True

Zinc	2000	1990	99.5	2000	1940	97.0	2000	1920	96.0
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Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time: Sample ID:	CCV	13:40 CCV6		CCV	14:31 CCV7		CCV	15:12 CCV8	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	1910	95.5	2000	1900	95.0	2000	1890	94.5
Arsenic	2000	1900	95.0	2000	1890	94.5	2000	1880	94.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	1880	94.0	2000	1870	93.5	2000	1860	93.0
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	2000	1870	93.5	2000	1860	93.0	2000	1850	92.5
Copper	2000	1850	92.5	2000	1830	91.5	2000	1820	91.0
Iron	40000	36600	91.5	40000	36600	91.5	40000	36800	92.0
Lead	2000	1870	93.5	2000	1860	93.0	2000	1860	93.0
Lithium									
Magnesium	anr								
Manganese	2000	1860	93.0	2000	1840	92.0	2000	1810	90.5
Molybdenum									
Nickel	2000	1870	93.5	2000	1860	93.0	2000	1860	93.0
Phosphorus									
Potassium	anr								
Selenium	2000	1890	94.5	2000	1870	93.5	2000	1870	93.5
Silicon									
Silver	250	234	93.6	250	231	92.4	250	229	91.6
Sodium	anr								
Strontium									
Sulfur									
Thallium	2000	1910	95.5	2000	1900	95.0	2000	1890	94.5
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time:		13:40			14:31			15:12		
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc	2000	1860	93.0	2000	1850	92.5	2000	1840	92.0	
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Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time: Sample ID: CCV		15:41 CCV9	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	2000	1910	95.5
Arsenic	2000	1900	95.0
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	2000	1880	94.0
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	2000	1870	93.5
Copper	2000	1840	92.0
Iron	40000	36400	91.0
Lead	2000	1880	94.0
Lithium			
Magnesium	anr		
Manganese	2000	1860	93.0
Molybdenum			
Nickel	2000	1880	94.0
Phosphorus			
Potassium	anr		
Selenium	2000	1880	94.0
Silicon			
Silver	250	231	92.4
Sodium	anr		
Strontium			
Sulfur			
Thallium	2000	1910	95.5
Tin			
Titanium			
Tungsten			
Vanadium	anr		

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53188      Units: ug/l

Time:	15:41
Sample ID:	CCV
	CCV9
Metal	True
Results	% Rec

Zinc      2000      1870      93.5

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

6.3.5

6

## HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP  
 QC Limits: 90 to 110 % Recovery

Date Analyzed: 10/20/22  
 Run ID: MA53188

Methods: EPA 200.7, SW846 6010D  
 Units: ug/l

Time:		08:49			08:55		
Sample ID:	HSTD	HSTD1		HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	8000	7790	97.4				
Arsenic	8000	7770	97.1				
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	8000	7620	95.3				
Calcium							
Cerium							
Chromium	anr						
Cobalt	8000	7680	96.0				
Copper	8000	7790	97.4				
Iron				200000	196000	98.0	
Lead	8000	7770	97.1				
Lithium							
Magnesium							
Manganese	8000	7970	99.6				
Molybdenum							
Nickel	8000	7650	95.6				
Phosphorus							
Potassium							
Selenium	8000	7900	98.8				
Silicon							
Silver	625	607	97.1				
Sodium							
Strontium							
Sulfur							
Thallium	8000	7630	95.4				
Tin							
Titanium							
Tungsten							
Vanadium	anr						

# HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA53188 Units: ug/l

Time:		08:49		08:55	
Sample ID:		HSTD		HSTD	
Metal		True		True	
		Results		Results	
		% Rec		% Rec	

Zinc 8000 8020 100.3

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.3.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53188 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	08:30 CRID2	% Rec	08:34 CRI1	% Rec	09:25 CRID3	% Rec
Metal	True	True	True	Results		Results		Results	
Aluminum	200	500	100						
Antimony	6.0	20	3.0			6.50	108.3		
Arsenic	8.0	20	3.0	3.20	106.7	7.10	88.8	3.10	103.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0			3.00	100.0	0.900	90.0
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0	2.70	90.0	48.6	97.2	2.60	86.7
Copper	10		2.0			10.7	107.0		
Iron	100	500				104	104.0		
Lead	3.0	20	2.5			2.90	96.7		
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	2.80	93.3	15.6	104.0	2.80	93.3
Molybdenum	20								
Nickel	10		4.0	3.50	87.5	9.70	97.0	3.60	90.0
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0			10.4	104.0		
Silicon	200								
Silver	5.0		2.0			5.50	110.0		
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	2.20	110.0	11.0	110.0		
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53188 Units: ug/l

Time:					08:30		08:34		09:25	
Sample ID:	CRI	CRIA	CRID	CRID2	Results	% Rec	CRID1	Results	CRID3	% Rec
Metal	True	True	True							

Zinc	20		10	9.80	98.0		20.5	102.5	9.60	96.0
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Zirconium	10									
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(\*) Outside of QC limits  
 (anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53188 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	15:22 CRID4	% Rec	15:27 CRI2	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100				
Antimony	6.0	20	3.0			6.70	111.7
Arsenic	8.0	20	3.0	3.60	120.0	8.50	106.3
Barium	200		4.0				
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0			2.80	93.3
Calcium	5000	2000	1000	anr			
Cerium							
Chromium	10		2.0	anr			
Cobalt	50		3.0	2.40	80.0	45.3	90.6
Copper	10		2.0			9.20	92.0
Iron	100	500				87.0	87.0
Lead	3.0	20	2.5			3.00	100.0
Lithium	50						
Magnesium	5000	2000	100	anr			
Manganese	15		3.0	2.50	83.3	13.8	92.0
Molybdenum	20						
Nickel	10		4.0	3.40	85.0	9.10	91.0
Phosphorus	50						
Potassium	5000		2000	anr			
Selenium	10	20	5.0			10.2	102.0
Silicon	200						
Silver	5.0		2.0			4.40	88.0
Sodium	5000		1000	anr			
Strontium	10						
Sulfur	50						
Thallium	10		2.0			9.70	97.0
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0	anr			

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120%    CRIA 80-120%      Run ID: MA53188      Units: ug/l

Time:					15:22		15:27	
Sample ID:	CRI	CRIA	CRID		CRID4		CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc	20		10	9.60	96.0	19.2	96.0	
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Zirconium	10							
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(\*) Outside of QC limits  
 (anr) Analyte not requested

6.3.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP      Date Analyzed: 10/20/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA53188      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	08:39 ICSAB1 Results	% Rec	08:44 ICSAB1 Results	% Rec	15:32 ICSAB2 Results	% Rec	15:37 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	509000	101.8	500000	100.0	468000	93.6	462000	92.4
Antimony		1000	-0.300		1010	101.0	1.00		952	95.2
Arsenic		1000	-0.900		1010	101.0	-1.40		936	93.6
Barium		500	3.00		491	98.2	1.80		453	90.6
Beryllium		500	0.200		488	97.6	0.200		445	89.0
Bismuth		500	8.50		478	95.6	6.00		440	88.0
Boron		500	-3.40		498	99.6	-2.30		459	91.8
Cadmium		1000	1.30		1040	104.0	1.10		958	95.8
Calcium	400000	400000	403000	100.8	378000	94.5	364000	91.0	353000	88.3
Cerium			73.3		562*		68.6		521*	
Chromium		500	0.700		482	96.4	0.800		440	88.0
Cobalt		500	0.700		484	96.8	0.700		454	90.8
Copper		500	-4.00		502	100.4	-2.90		461	92.2
Iron	200000	200000	205000	102.5	199000	99.5	183000	91.5	180000	90.0
Lead		1000	1.20		935	93.5	2.60		885	88.5
Lithium		500	-8.60		513	102.6	-6.60		475	95.0
Magnesium	500000	500000	491000	98.2	486000	97.2	441000	88.2	441000	88.2
Manganese		500	8.60		519	103.8	7.20		469	93.8
Molybdenum		500	0.00		466	93.2	-0.100		431	86.2
Nickel		1000	1.60		932	93.2	1.50		879	87.9
Phosphorus		500	-1.50		458	91.6	1.10		432	86.4
Potassium			-706		-656		-547		-549	
Selenium		1000	0.400		939	93.9	-5.20		878	87.8
Silicon		500	6.60		515	103.0	5.80		484	96.8
Silver		1000	0.600		1020	102.0	-3.00		925	92.5
Sodium			75.5		83.9		220		228	
Strontium		500	-3.50		482	96.4	-3.20		447	89.4
Sulfur		500	-16.2		460	92.0	37.2		489	97.8
Thallium		1000	-1.10		874	87.4	-6.60		856	85.6
Tin		500	-4.40		465	93.0	-4.00		429	85.8
Titanium		500	-1.80		480	96.0	-1.60		445	89.0
Tungsten		500	-1.50		460	92.0	-2.00		423	84.6
Vanadium		500	-2.10		489	97.8	-1.80		443	88.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102022M1.ICP Date Analyzed: 10/20/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA53188 Units: ug/l

Time:				08:39			08:44			15:32			15:37
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Zinc		1000	1.10			948	94.8	1.90		876	87.6		
Zirconium		500	2.00			440	88.0	0.700		400	80.0		
(*) Outside of QC limits													
(anr) Analyte not requested													

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:44	MA53201-STD1	1		STDA
08:49	MA53201-STD2	1		STDB
08:54	MA53201-ICV1	1		
09:02	MA53201-ICB1	1		
09:07	MA53201-CCV1	1		
09:12	MA53201-CCB1	1		
09:17	MA53201-CRID1	1		
09:22	MA53201-CRI1	1		
09:27	MA53201-ICSA1	1		
09:32	MA53201-ICSAB1	1		
09:37	MA53201-HSTD1	1		
09:42	MA53201-HSTD2	1		
09:47	ZZZZZZ	1		
09:52	ZZZZZZ	1		
09:57	ZZZZZZ	1		
10:02	MA53201-CCV2	1		
10:07	MA53201-CCB2	1		
10:12	MP35770-MB1	1		
10:17	JD53458-1F	5		
10:22	JD53458-3F	5		
10:27	JD53458-5F	2		
10:31	JD53458-7F	2		
10:36	JD53458-9F	20		
10:41	JD53458-11F	10		
10:46	JD53458-13F	10		
10:51	JD53458-15F	5		
10:56	MA53201-CCV3	1		
11:01	MA53201-CCB3	1		
11:06	JD53458-17F	10		
11:11	JD53458-17F	100		
11:15	JD53458-19F	10		
11:20	JD53458-19F	100		
11:25	JD53458-21F	20		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:30	JD53458-23F	20		
11:35	JD53458-25F	10		
11:40	JD53458-27F	10		
11:44	JD53458-29F	10		
11:49	MA53201-CCV4	1		
11:54	MA53201-CCB4	1		
11:59	JD53458-31F	10		
12:04	JD53458-33F	10		
12:09	JD53458-33F	100		
----->	Last reportable sample/prep for job JD53458			
12:14	MP35870-MB1	1		
12:19	MP35870-LB1	1		
12:24	MP35870-B1	1		
12:29	MP35870-LS1	1		Y3600 saturation
12:33	MP35870-S1	1		
12:38	MP35870-S2	1		
12:43	MA53201-CCV5	1		
12:48	MA53201-CCB5	1		
12:53	JD53866-1A	1		(sample used for QC only; not part of login JD53458)
12:58	MP35870-SD1	5		
13:03	ZZZZZZ	1		
13:08	ZZZZZZ	1		
13:13	ZZZZZZ	1		
13:18	MP35862-B1	1		
13:23	MP35862-MB1	1		
13:28	MA53201-CRID2	1		
13:33	MP35862-S1	1		
13:38	MA53201-CCV6	1		
13:43	MA53201-CCB6	1		
13:48	ZZZZZZ	10		
14:36	ZZZZZZ	1		
14:41	MA53201-CRID3	1		
14:45	MA53201-CRI2	1		
14:50	MA53201-ICSA2	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Dilution Factor	PS Recov	Comments
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14:55 MA53201-ICSAB2 1

15:04 MA53201-CCV7 1

15:13 MA53201-CCB7 1

-----> Last reportable CCB for job JD53458  
Refer to raw data for calibration curve and standards.



REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Element: Dilution	Sb	As	Cd	Pb	Se	Tl
08:54	MA53201-ICV1	1	X	X	X	X	X	X
09:02	MA53201-ICB1	1	X	X	X	X	X	X
09:07	MA53201-CCV1	1	X	X	X	X	X	X
09:12	MA53201-CCB1	1	X	X	X	X	X	X
09:17	MA53201-CRID1	1	X	X	X	X	X	X
09:22	MA53201-CRI1	1	X	X	X	X	X	X
09:27	MA53201-ICSA1	1	X	X	X	X	X	X
09:32	MA53201-ICSAB1	1	X	X	X	X	X	X
09:37	MA53201-HSTD1	1	X	X	X	X	X	X
09:42	MA53201-HSTD2	1						
09:47	ZZZZZZ	1						
09:52	ZZZZZZ	1						
09:57	ZZZZZZ	1						
10:02	MA53201-CCV2	1	X	X	X	X	X	X
10:07	MA53201-CCB2	1	X	X	X	X	X	X
10:12	MP35770-MB1	1	X					
10:17	JD53458-1F	5	X					
10:22	JD53458-3F	5	X					
10:27	JD53458-5F	2	X					
10:31	JD53458-7F	2	X					
10:36	JD53458-9F	20	X		X	X	X	
10:41	JD53458-11F	10	X		X	X	X	
10:46	JD53458-13F	10	X		X	X	X	
10:51	JD53458-15F	5	X		X	X	X	
10:56	MA53201-CCV3	1	X	X	X	X	X	X
11:01	MA53201-CCB3	1	X	X	X	X	X	X
11:06	JD53458-17F	10	X		X	X		
11:11	JD53458-17F	100		X	X		X	
11:15	JD53458-19F	10	X		X	X		
11:20	JD53458-19F	100		X	X		X	
11:25	JD53458-21F	20	X	X	X	X	X	X
11:30	JD53458-23F	20	X	X	X	X	X	X
11:35	JD53458-25F	10	X	X	X	X	X	X
		Element:	Sb	As	Cd	Pb	Se	Tl

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Element: Dilution	S b	A s	C d	P b	S e	T l
11:40	JD53458-27F	10	X	X	X	X	X	X
11:44	JD53458-29F	10	X	X	X			
11:49	MA53201-CCV4	1	X	X	X	X	X	X
11:54	MA53201-CCB4	1	X	X	X	X	X	X
11:59	JD53458-31F	10		X	X			
12:04	JD53458-33F	10	X			X	X	
12:09	JD53458-33F	100		X	X			X
12:14	MP35870-MB1	1		X	X	X	X	
12:19	MP35870-LB1	1						
12:24	MP35870-B1	1		X	X	X	X	
12:29	MP35870-LS1	1		X	X	X	X	
12:33	MP35870-S1	1		X	X	X	X	
12:38	MP35870-S2	1		X	X	X	X	
12:43	MA53201-CCV5	1	X	X	X	X	X	X
12:48	MA53201-CCB5	1	X	X	X	X	X	X
12:53	JD53866-1A	1		X	X	X	X	(a)
12:58	MP35870-SD1	5		X	X	X	X	
13:03	ZZZZZZ	1						
13:08	ZZZZZZ	1						
13:13	ZZZZZZ	1						
13:18	MP35862-B1	1						
13:23	MP35862-MB1	1						
13:28	MA53201-CRID2	1	X	X	X	X	X	X
13:33	MP35862-S1	1						
13:38	MA53201-CCV6	1	X	X	X	X	X	X
13:43	MA53201-CCB6	1	X	X	X	X	X	X
13:48	ZZZZZZ	10						
14:36	ZZZZZZ	1						
14:41	MA53201-CRID3	1	X	X	X	X	X	X
14:45	MA53201-CRI2	1	X	X	X	X	X	X
14:50	MA53201-ICSA2	1	X	X	X	X	X	X
14:55	MA53201-ICSAB2	1	X	X	X	X	X	X
15:04	MA53201-CCV7	1	X	X	X	X	X	X
		Element:	S b	A s	C d	P b	S e	T l

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Dilution	Element: S A C P S T					
			b s d b e l					

15:13 MA53201-CCB7 1 X X X X X X

(a) Sample used for QC only; not part of login JD53458.

Element: S A C P S T  
b s d b e l

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:44	MA53201-STD1	6998 R	176230 R	14175 R	11908 R
08:49	MA53201-STD2	6660	166290	14044	10578
08:54	MA53201-ICV1	6868	169660	14009	10966
09:02	MA53201-ICB1	6967	175230	14028	11876
09:07	MA53201-CCV1	6822	170150	14102	10939
09:12	MA53201-CCB1	6959	175390	14093	11872
09:17	MA53201-CRID1	7002	176820	14221	11869
09:22	MA53201-CRI1	6888	173710	13963	11603
09:27	MA53201-ICSA1	6311	155200	13710	9787
09:32	MA53201-ICSAB1	6274	154900	13723	9761
09:37	MA53201-HSTD1	6782	172730	14164	11473
09:42	MA53201-HSTD2	6323	156620	13601	9796
09:47	ZZZZZZ	6872	173350	14010	11751
09:52	ZZZZZZ	6831	175540	14164	11827
09:57	ZZZZZZ	6913	174750	13944	11768
10:02	MA53201-CCV2	6762	168250	13842	10872
10:07	MA53201-CCB2	6995	176160	14095	11910
10:12	MP35770-MB1	7027	177140	14254	11977
10:17	JD53458-1F	6818	171350	14046	11228
10:22	JD53458-3F	6819	171600	14150	11216
10:27	JD53458-5F	6748	169750	14132	10963
10:31	JD53458-7F	6740	169180	14098	10918
10:36	JD53458-9F	6868	172790	14117	11307
10:41	JD53458-11F	6716	169010	13928	10935
10:46	JD53458-13F	6785	170810	13900	11294
10:51	JD53458-15F	6780	169730	13950	11154
10:56	MA53201-CCV3	6815	169480	14000	10933
11:01	MA53201-CCB3	6939	174270	13938	11881
11:06	JD53458-17F	6746	169280	13939	11104
11:11	JD53458-17F	6900	173370	13996	11694
11:15	JD53458-19F	6717	169150	13986	11031
11:20	JD53458-19F	6889	172800	13885	11667
11:25	JD53458-21F	6753	170120	14033	11120

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP  
 Analyst: ND  
 Parameters: Sb,As,Cd,Pb,Se,Tl

Date Analyzed: 10/24/22  
 Run ID: MA53201  
 Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
11:30	JD53458-23F	6773	169870	13911	11164
11:35	JD53458-25F	6765	170200	14045	11075
11:40	JD53458-27F	6707	167630	14023	10877
11:44	JD53458-29F	6929	174300	14192	11576
11:49	MA53201-CCV4	6754	167880	13851	10870
11:54	MA53201-CCB4	6788	173340	13796	11658
11:59	JD53458-31F	6853	171590	13966	11511
12:04	JD53458-33F	6682	167480	13920	10966
12:09	JD53458-33F	6837	171820	13775	11621
12:14	MP35870-MB1	6909	175390	14127	11786
12:19	MP35870-LB1	6191	150200	13664	9563
12:24	MP35870-B1	6769	169190	13935	11039
12:29	MP35870-LS1	6320	999999	13657	9535
12:33	MP35870-S1	6238	153900	13878	9453
12:38	MP35870-S2	6175	152420	13628	9367
12:43	MA53201-CCV5	6714	166350	13723	10811
12:48	MA53201-CCB5	6822	171480	13635	11691
12:53	JD53866-1A	6087	149310	13428	9370
12:58	MP35870-SD1	6523	160790	13489	10404
13:03	ZZZZZZ	6234	150880	13617	9577
13:08	ZZZZZZ	5919	147250	13421	9055
13:13	ZZZZZZ	6258	151690	13680	9570
13:18	MP35862-B1	No results reported for the elements associated with this internal standard.			
13:23	MP35862-MB1	No results reported for the elements associated with this internal standard.			
13:28	MA53201-CRID2	6798	170910	13571	11638
13:33	MP35862-S1	No results reported for the elements associated with this internal standard.			
13:38	MA53201-CCV6	6682	165840	13650	10809
13:43	MA53201-CCB6	6805	171120	13614	11712
13:48	ZZZZZZ	6752	168620	13700	11303
14:36	ZZZZZZ	7095	172880	13704	11883
14:41	MA53201-CRID3	6996	169770	13464	11711
14:45	MA53201-CRI2	6924	167640	13418	11468
14:50	MA53201-ICSA2	6389	150740	13169	9733

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53201  
Parameters: Sb,As,Cd,Pb,Se,Tl

Sample					
Time	Description	Istd#1	Istd#2	Istd#3	Istd#4
14:55	MA53201-ICSAB2	6228	150140	13108	9530
15:04	MA53201-CCV7	6831	164330	13469	10777
15:13	MA53201-CCB7	6985	170590	13513	11687

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

(a) No samples reported for the elements associated with this internal standard.

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53201 Units: ug/l

Time: Sample ID:			09:02 ICB1		09:12 CCB1		10:07 CCB2		11:01 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7	-1.80	<6.0	-1.30	<6.0	-0.800	<6.0	-1.70	<6.0
Arsenic	3.0	2.1	-0.200	<3.0	-0.300	<3.0	0.00	<3.0	-0.300	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	-0.100	<3.0	0.100	<3.0	0.00	<3.0	0.100	<3.0
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	0.00	<3.0	0.500	<3.0	0.800	<3.0	0.100	<3.0
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2	-1.00	<10	-0.900	<10	0.400	<10	1.00	<10
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	0.400	<10	0.00	<10	1.20	<10	-0.700	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53201 Units: ug/l

Time: Sample ID:			09:02 ICB1		09:12 CCB1		10:07 CCB2		11:01 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

6.4.3  
6



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53201 Units: ug/l

Time: Sample ID:			11:54 CCB4		12:48 CCB5		13:43 CCB6		15:13 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7	-2.20	<6.0	-1.10	<6.0	-0.700	<6.0	-0.600	<6.0
Arsenic	3.0	2.1	-0.500	<3.0	0.200	<3.0	0.500	<3.0	0.100	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.00	<3.0	0.200	<3.0	0.300	<3.0	0.200	<3.0
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	0.100	<3.0	0.800	<3.0	1.30	<3.0	0.300	<3.0
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2	0.100	<10	0.700	<10	1.50	<10	1.70	<10
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	1.20	<10	2.80	<10	2.90	<10	1.80	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53201 Units: ug/l

Time: Sample ID:			11:54 CCB4		12:48 CCB5		13:43 CCB6		15:13 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time: Sample ID:		08:54 ICV1		09:07 CCV1		10:02 CCV2			
Metal	ICV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony	2000	1980	99.0	2000	1990	99.5	2000	1980	99.0
Arsenic	2000	1970	98.5	2000	1980	99.0	2000	1980	99.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	2000	100.0	2000	2060	103.0	2000	2060	103.0
Calcium									
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	1990	99.5	2000	2040	102.0	2000	2050	102.5
Lithium									
Magnesium									
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium									
Selenium	2000	2010	100.5	2000	2060	103.0	2000	2060	103.0
Silicon									
Silver	anr								
Sodium									
Strontium									
Sulfur									
Thallium	2000	2080	104.0	2000	2130	106.5	2000	2120	106.0
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time:		08:54			09:07			10:02		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time: Sample ID:			10:56 CCV3			11:49 CCV4			12:43 CCV5			
Metal	True		Results	% Rec	True		Results	% Rec	True		Results	% Rec
Aluminum												
Antimony	2000		1990	99.5	2000		2000	100.0	2000		1990	99.5
Arsenic	2000		1990	99.5	2000		2000	100.0	2000		1990	99.5
Barium	anr											
Beryllium	anr											
Bismuth												
Boron												
Cadmium	2000		2060	103.0	2000		2040	102.0	2000		2050	102.5
Calcium												
Cerium												
Chromium	anr											
Cobalt	anr											
Copper	anr											
Iron	anr											
Lead	2000		2050	102.5	2000		2020	101.0	2000		2020	101.0
Lithium												
Magnesium												
Manganese	anr											
Molybdenum												
Nickel	anr											
Phosphorus												
Potassium												
Selenium	2000		2070	103.5	2000		2030	101.5	2000		2020	101.0
Silicon												
Silver	anr											
Sodium												
Strontium												
Sulfur												
Thallium	2000		2130	106.5	2000		2070	103.5	2000		1990	99.5
Tin												
Titanium												
Tungsten												
Vanadium												

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time:		10:56		11:49		12:43			
Sample ID:	CCV	CCV3		CCV	CCV4	CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.4.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time: Sample ID:		13:38 CCV6		15:04 CCV7		
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	2000	1980	99.0	2000	1930	96.5
Arsenic	2000	1980	99.0	2000	1930	96.5
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	2000	2050	102.5	2000	1990	99.5
Calcium						
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	2000	2010	100.5	2000	2000	100.0
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	2000	2010	100.5	2000	1960	98.0
Silicon						
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	2000	1960	98.0	2000	1970	98.5
Tin						
Titanium						
Tungsten						
Vanadium						

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53201      Units: ug/l

Time:		13:38			15:04		
Sample ID:		CCV	CCV6	CCV	CCV7		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.4.4

6



## HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 10/24/22  
Run ID: MA53201

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:		09:37 HSTD1		09:42 HSTD2		
Metal	HSTD	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	8000	7980	99.8			
Arsenic	8000	7900	98.8			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	8000	7740	96.8			
Calcium						
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron						
Lead	8000	8020	100.3			
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	8000	8070	100.9			
Silicon						
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	8000	8220	102.8			
Tin						
Titanium						
Tungsten						
Vanadium						

HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA53201      Units: ug/l

Time:		09:37		09:42	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53201 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	09:17 CRID1		09:22 CRI1		13:28 CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100						
Antimony	6.0	20	3.0			5.00	83.3		
Arsenic	8.0	20	3.0	2.50	83.3	8.20	102.5	3.10	103.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	1.10	110.0	3.20	106.7	1.00	100.0
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0	anr					
Copper	10		2.0						
Iron	100	500							
Lead	3.0	20	2.5			2.90	96.7		
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0	5.10	102.0	11.2	112.0		
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000						
Strontium	10								
Sulfur	50								
Thallium	10		2.0			10.4	104.0		
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53201 Units: ug/l

Time:					09:17		09:22		13:28	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	CRID1	Results	% Rec	CRID2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.4.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53201 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:41 CRID3		14:45 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec
Aluminum	200	500	100				
Antimony	6.0	20	3.0			5.00	83.3
Arsenic	8.0	20	3.0	2.90	96.7	7.80	97.5
Barium	200		4.0	anr			
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0	1.00	100.0	3.10	103.3
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0	anr			
Copper	10		2.0				
Iron	100	500					
Lead	3.0	20	2.5			2.80	93.3
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0	anr			
Molybdenum	20						
Nickel	10		4.0	anr			
Phosphorus	50						
Potassium	5000		2000				
Selenium	10	20	5.0	5.40	108.0	11.5	115.0
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000				
Strontium	10						
Sulfur	50						
Thallium	10		2.0			11.8	118.0
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53201 Units: ug/l

Time:					14:41		14:45	
Sample ID:	CRI	CRIA	CRID		CRID3		CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.4.6

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP      Date Analyzed: 10/24/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA53201      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	09:27 ICSAB1 Results	% Rec	09:32 ICSAB1 Results	% Rec	14:50 ICSAB2 Results	% Rec	14:55 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	519000	103.8	504000	100.8	508000	101.6	508000	101.6
Antimony		1000	-2.90		1030	103.0	-1.90		1030	103.0
Arsenic		1000	0.300		1030	103.0	1.30		1020	102.0
Barium		500	3.50		493	98.6	3.50		495	99.0
Beryllium		500	0.400		492	98.4	0.400		500	100.0
Bismuth		500	8.80		488	97.6	9.30		484	96.8
Boron		500	-2.10		503	100.6	-2.70		495	99.0
Cadmium		1000	1.30		1060	106.0	1.00		1060	106.0
Calcium	400000	400000	408000	102.0	383000	95.8	404000	101.0	391000	97.8
Cerium			67.7				69.4			
Chromium		500	4.20		491	98.2	4.50		501	100.2
Cobalt		500	0.600		492	98.4	0.600		499	99.8
Copper		500	-8.10		503	100.6	-7.70		513	102.6
Iron	200000	200000	207000	103.5	202000	101.0	207000	103.5	206000	103.0
Lead		1000	1.40		961	96.1	2.70		976	97.6
Lithium		500	-2.00		525	105.0	-2.10		526	105.2
Magnesium	500000	500000	503000	100.6	497000	99.4	497000	99.4	502000	100.4
Manganese		500	9.40		525	105.0	9.60		536	107.2
Molybdenum		500	0.200		479	95.8	0.100		475	95.0
Nickel		1000	2.30		954	95.4	2.40		971	97.1
Phosphorus		500	-6.40		476	95.2	1.10		464	92.8
Potassium			-704		-663		-759		-716	
Selenium		1000	4.80		965	96.5	2.80		955	95.5
Silicon		500	12.2		497	99.4	10.1		491	98.2
Silver		1000	3.00		1020	102.0	0.700		1040	104.0
Sodium			101		125		108		128	
Strontium		500	-3.50		478	95.6	-3.50		477	95.4
Sulfur		500	-26.1		461	92.2	-24.4		462	92.4
Thallium		1000	-5.70		959	95.9	-0.700		909	90.9
Tin		500	-3.30		474	94.8	-4.70		473	94.6
Titanium		500	-1.60		490	98.0	-1.40		499	99.8
Tungsten		500	-2.50		468	93.6	-1.80		469	93.8
Vanadium		500	-2.40		499	99.8	-2.50		509	101.8

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102422M1.ICP Date Analyzed: 10/24/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA53201 Units: ug/l

Time:				09:27			09:32			14:50			14:55
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	9.80			971	97.1	13.6		966	96.6		
Zirconium		500	3.20			450	90.0	0.800		530	106.0		

(\*) Outside of QC limits  
(anr) Analyte not requested



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:56	MA53204-STD1	1		STDA
07:01	MA53204-STD2	1		STDB
07:06	MA53204-ICV1	1		
07:14	MA53204-ICB1	1		
07:19	ZZZZZZ	1		
07:26	MA53204-ICCV1	1		
07:35	MA53204-CCB1	1		
07:40	MA53204-CRID1	1		
07:45	MA53204-CRI1	1		
07:50	MA53204-ICSA1	1		
07:55	MA53204-ICSAB1	1		
08:00	MA53204-HSTD1	1		
08:05	MA53204-HSTD2	1		
08:10	ZZZZZZ	1		
08:15	ZZZZZZ	1		
08:20	ZZZZZZ	1		
08:25	MA53204-CCV1	1		
08:30	MA53204-CCB2	1		
08:35	MP35821-S1	10		needs post spike for SE
08:40	MP35821-S2	10		
08:44	JD53458-39F	10		
08:49	MP35821-SD1	50		
08:54	JD53458-35F	10		
08:59	JD53458-35F	50		
09:04	JD53458-37F	10		
09:09	JD53458-37F	50		
09:13	ZZZZZZ	1		
09:18	MA53204-CCV2	1		
09:23	MA53204-CCB3	1		
09:28	MP35882-MB1	1		
09:33	MP35882-B1	1		
09:38	MP35882-S1	1		
09:43	MP35882-S2	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:48	JD54050-1	1		(sample used for QC only; not part of login JD53458)
09:53	MP35882-SD1	5		
09:57	JD54050-1	1		(sample used for QC only; not part of login JD53458)
10:02	ZZZZZZ	1		
10:07	MA53204-CRID2	1		
10:12	MA53204-CCV3	1		
10:17	MA53204-CCB4	1		
10:22	MP35862-MB1	1		
10:27	MP35862-B1	1		
10:32	MP35862-S1	1		AS high
10:37	MP35862-S2	1		AS high
10:41	JD53458-2	1		AS high
10:46	MP35862-SD1	5		AS high
10:51	MP35862-PS1	1		
10:56	JD53458-4	1		AS, FE high
11:01	JD53458-6	1		AS high
11:06	JD53458-8	1		AS, FE high
11:10	MA53204-CCV4	1		
11:15	MA53204-CCB5	1		
11:20	JD53458-10	1		FE high
11:25	JD53458-12	1		FE high
11:30	JD53458-14	1		FE high
11:34	JD53458-16	1		FE high
11:39	JD53458-18	1		FE high
11:44	JD53458-20	1		FE high
11:49	JD53458-22	1		FE high
11:54	JD53458-24	1		FE high
11:59	JD53458-26	1		FE high
12:04	JD53458-28	1		FE high
12:09	MA53204-CCV5	1		
12:14	MA53204-CCB6	1		
12:19	JD53458-30	1		FE high
12:24	JD53458-32	1		FE high

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:28	JD53458-34	1		FE high
12:33	JD53458-36	1		FE high
12:38	JD53458-38	1		FE high
12:43	JD53458-40	1		FE high
----->	Last reportable sample/prep for job JD53458			
12:48	MP35886-B1	1		CCV out
12:53	MP35886-MB1	1		CCV out
12:58	MP35886-S1	1		CCV out
13:03	MA53204-CCV6	1		
13:07	MA53204-CCB7	1		
13:12	MP35886-S2	1		CCV out
13:17	JD53611-5	1		(sample used for QC only; not part of login JD53458)
13:22	MP35886-SD1	5		
13:27	MP35886-PS1	1		
13:32	ZZZZZZ	1		
13:37	ZZZZZZ	1		
13:41	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:51	ZZZZZZ	1		
13:56	ZZZZZZ	1		
14:01	MA53204-CCV7	1		
14:06	MA53204-CCB8	1		
14:11	MA53204-CRI2	1		
14:15	MP35870-LS1	1		
14:20	MP35844-B2	1		
14:25	MP35844-MB2	1		
14:30	MA53204-CRI3	1		
14:35	MA53204-ICSA2	1		
14:40	MA53204-ICSAB2	1		
14:45	MA53204-CCV8	1		
----->	Last reportable CCB for job JD53458			
14:50	MA53204-CCB9	1		
14:55	MP35874-MB1	1		
14:59	MP35874-LB1	1		
15:04	MP35874-B1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:09	MP35874-LS1	1		
15:14	MP35874-S1	1		
15:19	MP35874-S2	1		
15:23	JD53316-4	1		(sample used for QC only; not part of login JD53458)
15:28	MP35874-SD1	5		
15:33	ZZZZZZ	1		
15:38	MA53204-CCV9	1		
15:43	MA53204-CCB10	1		
15:48	ZZZZZZ	1		
15:53	ZZZZZZ	1		
15:58	ZZZZZZ	1		
16:03	ZZZZZZ	1		
16:08	ZZZZZZ	1		
16:13	ZZZZZZ	1		
16:18	ZZZZZZ	1		
16:23	ZZZZZZ	1		
16:28	ZZZZZZ	1		
16:33	MA53204-CCV10	1		
16:37	MA53204-CCB11	1		
16:42	ZZZZZZ	1		
16:47	ZZZZZZ	1		
16:52	ZZZZZZ	1		
16:57	MP35844-S1	1		
17:02	MP35844-S2	1		
17:07	JD53898-13	1		(sample used for QC only; not part of login JD53458)
17:12	MP35844-SD1	5		
17:16	ZZZZZZ	1		
17:21	ZZZZZZ	1		
17:26	MA53204-CCV11	1		
17:31	MA53204-CCB12	1		
17:36	ZZZZZZ	1		
17:41	ZZZZZZ	1		
17:46	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:51	ZZZZZZ	1		
17:56	ZZZZZZ	1		
18:01	MP35907-MB1	1		
18:06	MP35907-LB1	1		
18:11	MP35907-B1	1		
18:16	MP35907-LS1	1		
18:20	MA53204-CCV12	1		
18:25	MA53204-CCB13	1		
18:30	MP35907-S1	1		
18:35	MP35907-S2	1		
18:40	JD54047-1	1		(sample used for QC only; not part of login JD53458)
18:45	MP35907-SD1	5		
18:50	ZZZZZZ	1		
18:56	ZZZZZZ	1		
19:01	ZZZZZZ	1		
19:06	ZZZZZZ	1		
19:11	ZZZZZZ	1		
19:17	MA53204-CCV13	1		
19:21	MA53204-CCB14	1		
19:26	ZZZZZZ	1		
19:32	ZZZZZZ	1		
19:37	ZZZZZZ	1		
19:42	ZZZZZZ	1		
19:47	ZZZZZZ	1		
19:52	ZZZZZZ	1		
19:57	ZZZZZZ	1		
20:03	MA53204-CCV14	1		
20:07	MA53204-CCB15	1		
20:12	ZZZZZZ	1		
20:17	ZZZZZZ	1		
20:23	ZZZZZZ	1		
20:28	ZZZZZZ	1		
20:32	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
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20:38 ZZZZZZ 1

20:43 ZZZZZZ 1

20:48 MA53204-CCV15 1

20:53 MA53204-CCB16 1

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n
07:06	MA53204-ICV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:14	MA53204-ICB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:19	ZZZZZZ	1													
07:26	MA53204-ICCV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:35	MA53204-CCB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:40	MA53204-CRID1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:45	MA53204-CRI1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:50	MA53204-ICSA1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
07:55	MA53204-ICSAB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:00	MA53204-HSTD1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:05	MA53204-HSTD2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:10	ZZZZZZ	1													
08:15	ZZZZZZ	1													
08:20	ZZZZZZ	1													
08:25	MA53204-CCV1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:30	MA53204-CCB2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
08:35	MP35821-S1	10	X	X	X				X			X		X	
08:40	MP35821-S2	10	X	X	X				X			X		X	
08:44	JD53458-39F	10	X	X	X				X			X		X	
08:49	MP35821-SD1	50	X	X	X				X			X		X	
08:54	JD53458-35F	10	X						X			X		X	
08:59	JD53458-35F	50		X	X										
09:04	JD53458-37F	10	X						X			X			
09:09	JD53458-37F	50		X	X										
09:13	ZZZZZZ	1													
09:18	MA53204-CCV2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:23	MA53204-CCB3	1	X	X	X	X	X	X	X	X	X	X	X	X	X
09:28	MP35882-MB1	1													
09:33	MP35882-B1	1													
09:38	MP35882-S1	1													
09:43	MP35882-S2	1													
09:48	JD54050-1	1													
09:53	MP35882-SD1	5													
Element:			S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n
09:57	JD54050-1	1													
10:02	ZZZZZZ	1													
10:07	MA53204-CRID2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:12	MA53204-CCV3	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:17	MA53204-CCB4	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:22	MP35862-MB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:27	MP35862-B1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
10:32	MP35862-S1	1	X			X	X	X	X	X	X	X	X	X	X
10:37	MP35862-S2	1	X			X	X	X	X	X	X	X	X	X	X
10:41	JD53458-2	1	X			X	X	X	X	X	X	X	X	X	X
10:46	MP35862-SD1	5	X			X	X	X	X	X	X	X	X	X	X
10:51	MP35862-PS1	1	X												
10:56	JD53458-4	1				X				X					X
11:01	JD53458-6	1	X			X	X	X	X	X	X	X	X	X	X
11:06	JD53458-8	1				X				X					X
11:10	MA53204-CCV4	1	X	X	X	X	X	X	X	X	X	X	X	X	X
11:15	MA53204-CCB5	1	X	X	X	X	X	X	X	X	X	X	X	X	X
11:20	JD53458-10	1				X				X					X
11:25	JD53458-12	1				X				X					X
11:30	JD53458-14	1				X				X					X
11:34	JD53458-16	1				X				X					X
11:39	JD53458-18	1				X				X					X
11:44	JD53458-20	1				X				X					
11:49	JD53458-22	1				X				X					
11:54	JD53458-24	1				X				X					X
11:59	JD53458-26	1				X				X					X
12:04	JD53458-28	1				X				X					X
12:09	MA53204-CCV5	1	X	X	X	X	X	X	X	X	X	X	X	X	X
12:14	MA53204-CCB6	1	X	X	X	X	X	X	X	X	X	X	X	X	X
12:19	JD53458-30	1				X				X					X
12:24	JD53458-32	1				X				X					X
12:28	JD53458-34	1				X				X					X
12:33	JD53458-36	1				X				X					X
Element:			S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n



REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n
12:38	JD53458-38	1					X					X			X
12:43	JD53458-40	1					X					X			X
12:48	MP35886-B1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
12:53	MP35886-MB1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
12:58	MP35886-S1	1	X	X	X	X	X	X	X	X	X	X	X	X	X
13:03	MA53204-CCV6	1	X	X	X	X	X	X	X	X	X	X	X	X	X
13:07	MA53204-CCB7	1	X	X	X	X	X	X	X	X	X	X	X	X	X
13:12	MP35886-S2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
13:17	JD53611-5	1	X	X	X	X	X	X	X	X	X	X	X	X	(a)
13:22	MP35886-SD1	5	X	X	X	X	X	X	X	X	X	X	X	X	X
13:27	MP35886-PS1	1	X												
13:32	ZZZZZZ	1													
13:37	ZZZZZZ	1													
13:41	ZZZZZZ	1													
13:46	ZZZZZZ	1													
13:51	ZZZZZZ	1													
13:56	ZZZZZZ	1													
14:01	MA53204-CCV7	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:06	MA53204-CCB8	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:11	MA53204-CRI2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:15	MP35870-LS1	1					X						X		
14:20	MP35844-B2	1						X	X						
14:25	MP35844-MB2	1						X	X						
14:30	MA53204-CRI3	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:35	MA53204-ICSA2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:40	MA53204-ICSAB2	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:45	MA53204-CCV8	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:50	MA53204-CCB9	1	X	X	X	X	X	X	X	X	X	X	X	X	X
14:55	MP35874-MB1	1		X	X				X				X	X	
14:59	MP35874-LB1	1													
15:04	MP35874-B1	1		X	X				X				X	X	
15:09	MP35874-LS1	1		X	X				X				X	X	
15:14	MP35874-S1	1		X	X				X				X	X	
Element:			S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n
15:19	MP35874-S2	1		X	X				X			X	X		
15:23	JD53316-4	1		X	X				X			X	X	(a)	
15:28	MP35874-SD1	5		X	X				X			X	X		
15:33	ZZZZZZ	1													
15:38	MA53204-CCV9	1	X	X	X	X	X	X	X	X	X	X	X	X	X
15:43	MA53204-CCB10	1	X	X	X	X	X	X	X	X	X	X	X	X	X
15:48	ZZZZZZ	1													
15:53	ZZZZZZ	1													
15:58	ZZZZZZ	1													
16:03	ZZZZZZ	1													
16:08	ZZZZZZ	1													
16:13	ZZZZZZ	1													
16:18	ZZZZZZ	1													
16:23	ZZZZZZ	1													
16:28	ZZZZZZ	1													
16:33	MA53204-CCV10	1	X	X	X	X	X	X	X	X	X	X	X	X	X
16:37	MA53204-CCB11	1	X	X	X	X	X	X	X	X	X	X	X	X	X
16:42	ZZZZZZ	1													
16:47	ZZZZZZ	1													
16:52	ZZZZZZ	1													
16:57	MP35844-S1	1							X	X					
17:02	MP35844-S2	1							X	X					
17:07	JD53898-13	1							X					(a)	
17:12	MP35844-SD1	5							X	X					
17:16	ZZZZZZ	1													
17:21	ZZZZZZ	1													
17:26	MA53204-CCV11	1	X	X	X	X	X	X	X	X	X	X	X	X	X
17:31	MA53204-CCB12	1	X	X	X	X	X	X	X	X	X	X	X	X	X
17:36	ZZZZZZ	1													
17:41	ZZZZZZ	1													
17:46	ZZZZZZ	1													
17:51	ZZZZZZ	1													
17:56	ZZZZZZ	1													
Element:			S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n
18:01	MP35907-MB1	1		X	X				X			X	X		
18:06	MP35907-LB1	1													
18:11	MP35907-B1	1		X	X				X			X	X		
18:16	MP35907-LS1	1		X	X				X			X	X		
18:20	MA53204-CCV12	1	X	X	X	X	X	X	X	X	X	X	X	X	X
18:25	MA53204-CCB13	1	X	X	X	X	X	X	X	X	X	X	X	X	X
18:30	MP35907-S1	1		X	X				X			X	X		
18:35	MP35907-S2	1		X	X				X			X	X		
18:40	JD54047-1	1		X	X				X			X	X	(a)	
18:45	MP35907-SD1	5		X	X				X			X	X		
18:50	ZZZZZZ	1													
18:56	ZZZZZZ	1													
19:01	ZZZZZZ	1													
19:06	ZZZZZZ	1													
19:11	ZZZZZZ	1													
19:17	MA53204-CCV13	1	X	X	X	X	X	X	X	X	X	X	X	X	X
19:21	MA53204-CCB14	1	X	X	X	X	X	X	X	X	X	X	X	X	X
19:26	ZZZZZZ	1													
19:32	ZZZZZZ	1													
19:37	ZZZZZZ	1													
19:42	ZZZZZZ	1													
19:47	ZZZZZZ	1													
19:52	ZZZZZZ	1													
19:57	ZZZZZZ	1													
20:03	MA53204-CCV14	1	X	X	X	X	X	X	X	X	X	X	X	X	X
20:07	MA53204-CCB15	1	X	X	X	X	X	X	X	X	X	X	X	X	X
20:12	ZZZZZZ	1													
20:17	ZZZZZZ	1													
20:23	ZZZZZZ	1													
20:28	ZZZZZZ	1													
20:32	ZZZZZZ	1													
20:38	ZZZZZZ	1													
20:43	ZZZZZZ	1													
Element:			S b	A s	C d	C o	C u	F e	P b	M n	N i	S e	A g	T l	Z n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Dilution	Element: Sb	As	Cd	Co	Cu	Fe	Pb	Mn	Ni	Se	Ag	Tl	Zn
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20:48 MA53204-CCV15 1 X X X X X X X X X X X X X X X

20:53 MA53204-CCB16 1 X X X X X X X X X X X X X X X

(a) Sample used for QC only; not part of login JD53458.

Element: S A C C F P M N S A T Z  
b s d o u e b n i e g l n

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:56	MA53204-STD1	7869 R	195490 R	15489 R	12083 R
07:01	MA53204-STD2	7533	184730	15433	10740
07:06	MA53204-ICV1	7740	189360	15410	11101
07:14	MA53204-ICB1	7823	195710	15458	11995
07:19	ZZZZZZ	7897	195640	15481	12040
07:26	MA53204-ICCV1	7744	190850	15469	11105
07:35	MA53204-CCB1	7914	197140	15310	12092
07:40	MA53204-CRID1	7923	195450	15398	12103
07:45	MA53204-CRI1	7842	195270	15435	11808
07:50	MA53204-ICSA1	7223	175600	15205	9985
07:55	MA53204-ICSAB1	7206	172030	15113	9985
08:00	MA53204-HSTD1	7849	195790	15599	11782
08:05	MA53204-HSTD2	7282	178250	15161	10018
08:10	ZZZZZZ	7919	197030	15581	12062
08:15	ZZZZZZ	7867	199740	15707	12132
08:20	ZZZZZZ	8036	199300	15560	12164
08:25	MA53204-CCV1	7819	192260	15618	11144
08:30	MA53204-CCB2	7965	198830	15532	12076
08:35	MP35821-S1	7913	197340	15710	11679
08:40	MP35821-S2	7941	197220	15744	11718
08:44	JD53458-39F	7991	198500	15448	11830
08:49	MP35821-SD1	8032	200020	15638	12051
08:54	JD53458-35F	7812	194250	15716	11308
08:59	JD53458-35F	8008	199530	15641	11912
09:04	JD53458-37F	7985	199080	15755	11759
09:09	JD53458-37F	8082	200660	15653	12088
09:13	ZZZZZZ	7948	196030	15730	11397
09:18	MA53204-CCV2	7732	193470	15559	10987
09:23	MA53204-CCB3	8089	202000	15719	12205
09:28	MP35882-MB1	No results reported for the elements associated with this internal standard.			
09:33	MP35882-B1	No results reported for the elements associated with this internal standard.			
09:38	MP35882-S1	No results reported for the elements associated with this internal standard.			
09:43	MP35882-S2	No results reported for the elements associated with this internal standard.			

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
09:48	JD54050-1	No results reported for the elements associated with this internal standard.			
09:53	MP35882-SD1	No results reported for the elements associated with this internal standard.			
09:57	JD54050-1	No results reported for the elements associated with this internal standard.			
10:02	ZZZZZZ	8090	202670	15937	12166
10:07	MA53204-CRID2	8037	199800	15612	12118
10:12	MA53204-CCV3	7872	194520	15729	11146
10:17	MA53204-CCB4	7997	201820	15681	12051
10:22	MP35862-MB1	8175	204830	16047	12287
10:27	MP35862-B1	7967	197880	15920	11416
10:32	MP35862-S1	8197	201000	16691	11270
10:37	MP35862-S2	8241	202140	16814	11313
10:41	JD53458-2	8360	204550	16613	11703
10:46	MP35862-SD1	8208	204220	16118	11970
10:51	MP35862-PS1	8230	202390	16719	11376
10:56	JD53458-4	8436	206930	17035	11446
11:01	JD53458-6	8380	205020	17046	11345
11:06	JD53458-8	8302	204020	16980	11229
11:10	MA53204-CCV4	7929	196370	15777	11163
11:15	MA53204-CCB5	8159	200600	15831	12197
11:20	JD53458-10	8198	204550	17031	11372
11:25	JD53458-12	8238	203280	16917	11615
11:30	JD53458-14	8284	204900	17138	11432
11:34	JD53458-16	8292	204990	17116	11555
11:39	JD53458-18	8461	210180	17741	10909
11:44	JD53458-20	8196	206920	17530	10824
11:49	JD53458-22	8397	210160	17766	10758
11:54	JD53458-24	8535	210700	17823	10971
11:59	JD53458-26	8325	209380	17278	11327
12:04	JD53458-28	8373	207990	17394	11143
12:09	MA53204-CCV5	8035	199130	15853	11236
12:14	MA53204-CCB6	8110	202480	15595	12118
12:19	JD53458-30	8210	203940	16662	11400
12:24	JD53458-32	8217	204290	16777	11199

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:28	JD53458-34	8124	201900	16532	11187
12:33	JD53458-36	8156	201800	16736	10896
12:38	JD53458-38	8063	198080	16323	11051
12:43	JD53458-40	8072	196690	16665	10962
12:48	MP35886-B1	7758	192450	15142	11230
12:53	MP35886-MB1	7834	200060	15402	11906
12:58	MP35886-S1	7836	194440	15500	11247
13:03	MA53204-CCV6	7656	189080	14963	10972
13:07	MA53204-CCB7	7878	196630	14993	12029
13:12	MP35886-S2	7798	193770	15463	11245
13:17	JD53611-5	8072	198800	15621	11789
13:22	MP35886-SD1	7877	195960	15105	11905
13:27	MP35886-PS1	7818	190180	15336	11261
13:32	ZZZZZZ	7948	195910	15525	11708
13:37	ZZZZZZ	8164	199790	15919	11666
13:41	ZZZZZZ	7925	196540	15445	11811
13:46	ZZZZZZ	7902	192190	15370	11385
13:51	ZZZZZZ	8157	198860	15898	11529
13:56	ZZZZZZ	8013	197930	16003	11241
14:01	MA53204-CCV7	7676	190190	15077	11061
14:06	MA53204-CCB8	7822	195290	14840	12030
14:11	MA53204-CRI2	7800	194840	15022	11819
14:15	MP35870-LS1	7217	176070	15047	9731
14:20	MP35844-B2	7679	190080	15100	11292
14:25	MP35844-MB2	7698	192960	14837	11979
14:30	MA53204-CRI3	7803	194110	14971	11827
14:35	MA53204-ICSA2	7162	174700	14749	9978
14:40	MA53204-ICSAB2	7068	175070	14765	9867
14:45	MA53204-CCV8	7652	189000	14970	11050
14:50	MA53204-CCB9	7715	195420	14908	11883
14:55	MP35874-MB1	7962	198130	15252	12196
14:59	MP35874-LB1	7955	197800	15313	12186
15:04	MP35874-B1	7717	190600	15026	11421

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:09	MP35874-LS1	7751	191250	15004	11358
15:14	MP35874-S1	7730	192480	15138	11315
15:19	MP35874-S2	7802	178240	15182	11394
15:23	JD53316-4	7920	198140	15359	12140
15:28	MP35874-SD1	7797	194890	14837	12011
15:33	ZZZZZZ	7715	192780	15107	11588
15:38	MA53204-CCV9	7723	190810	15069	11116
15:43	MA53204-CCB10	7873	197290	15075	12065
15:48	ZZZZZZ	7003	172900	14746	9718
15:53	ZZZZZZ	7983	194750	15630	11249
15:58	ZZZZZZ	7397	180090	15357	9957
16:03	ZZZZZZ	7719	190310	15658	10595
16:08	ZZZZZZ	7254	179400	15221	9879
16:13	ZZZZZZ	7802	192000	15307	11642
16:18	ZZZZZZ	7113	177300	14964	9696
16:23	ZZZZZZ	7661	184210	15612	10503
16:28	ZZZZZZ	7596	185950	15514	10370
16:33	MA53204-CCV10	7586	187440	14732	10998
16:37	MA53204-CCB11	7789	194660	14797	12005
16:42	ZZZZZZ	7236	179500	14823	9806
16:47	ZZZZZZ	7678	187610	15464	10684
16:52	ZZZZZZ	8040	197780	15822	11399
16:57	MP35844-S1	7494	182310	14459	10900
17:02	MP35844-S2	7602	185400	14753	10992
17:07	JD53898-13	7606	187200	14904	11288
17:12	MP35844-SD1	7786	194220	15043	11838
17:16	ZZZZZZ	7379	185230	14843	10677
17:21	ZZZZZZ	7407	185350	14830	10678
17:26	MA53204-CCV11	7681	188710	15008	11111
17:31	MA53204-CCB12	7809	196700	15055	12010
17:36	ZZZZZZ	7290	183210	14502	10609
17:41	ZZZZZZ	7278	181530	14400	10516
17:46	ZZZZZZ	7521	186960	14744	11241



## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53204  
Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
17:51	ZZZZZZ	7765	188770	15062	11143
17:56	ZZZZZZ	7481	185680	14723	11184
18:01	MP35907-MB1	7791	195620	14960	12012
18:06	MP35907-LB1	7082	171440	14743	9876
18:11	MP35907-B1	7747	192220	15041	11328
18:16	MP35907-LS1	7217	175810	14930	9812
18:20	MA53204-CCV12	7731	190630	15003	11156
18:25	MA53204-CCB13	7964	200080	15236	12191
18:30	MP35907-S1	7145	175690	15016	9607
18:35	MP35907-S2	7193	176870	15108	9677
18:40	JD54047-1	7180	175530	14567	9717
18:45	MP35907-SD1	7565	188500	15274	10679
18:50	ZZZZZZ	7023	173450	14952	9530
18:56	ZZZZZZ	7190	176230	15104	9737
19:01	ZZZZZZ	6995	175100	14962	9478
19:06	ZZZZZZ	7028	173940	14977	9509
19:11	ZZZZZZ	6849	171160	14793	9309
19:17	MA53204-CCV13	7832	193960	15262	11179
19:21	MA53204-CCB14	8012	201590	15283	12151
19:26	ZZZZZZ	6680	168880	14644	9099
19:32	ZZZZZZ	6841	170790	14742	9275
19:37	ZZZZZZ	6701	168700	14610	9130
19:42	ZZZZZZ	7146	175620	14983	9722
19:47	ZZZZZZ	6959	173240	14751	9447
19:52	ZZZZZZ	7102	175470	14915	9614
19:57	ZZZZZZ	6998	174330	14897	9511
20:03	MA53204-CCV14	7803	193880	15138	11162
20:07	MA53204-CCB15	7982	201880	15149	12143
20:12	ZZZZZZ	7727	197680	14794	11748
20:17	ZZZZZZ	7923	201250	15128	12037
20:23	ZZZZZZ	7982	200830	15122	12188
20:28	ZZZZZZ	7439	186240	14723	10655
20:32	ZZZZZZ	7429	187440	14771	10703

# INTERNAL STANDARD SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA53204  
 Parameters: Sb,As,Cd,Co,Cu,Fe,Pb,Mn,Ni,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:38	ZZZZZZ	7999	201120	15102	12167
20:43	ZZZZZZ	7892	200190	15086	12024
20:48	MA53204-CCV15	7786	193510	14967	11151
20:53	MA53204-CCB16	7962	200800	15087	12140

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:			07:14 ICB1		07:35 CCB1		08:30 CCB2		09:23 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	0.800	<6.0	1.40	<6.0	0.600	<6.0	0.200	<6.0
Arsenic	3.0	2.1	-0.200	<3.0	0.100	<3.0	0.300	<3.0	-1.70	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.00	<3.0	0.00	<3.0	0.00	<3.0	0.100	<3.0
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	0.100	<50	0.00	<50	0.100	<50	0.100	<50
Copper	10	.8	0.200	<10	-0.100	<10	0.500	<10	1.40	<10
Iron	100	5.3	0.500	<100	2.70	<100	-2.80	<100	-1.30	<100
Lead	3.0	1.1	0.500	<3.0	-0.300	<3.0	-0.400	<3.0	0.300	<3.0
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	0.100	<15	0.100	<15	0.00	<15	0.100	<15
Molybdenum	20	.6								
Nickel	10	.4	0.300	<10	0.200	<10	0.100	<10	0.00	<10
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	-2.10	<10	-0.400	<10	-0.700	<10	0.200	<10
Silicon	200	1.7								
Silver	10	1	0.300	<10	0.700	<10	1.10	<10	1.70	<10
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	2.00	<10	1.20	<10	1.20	<10	1.40	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:			07:14 ICB1		07:35 CCB1		08:30 CCB2		09:23 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	0.600	<20	0.600	<20	-1.90	<20	-1.70	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

6.5.3

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BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:			10:17 CCB4		11:15 CCB5		12:14 CCB6		13:07 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	0.600	<6.0	1.10	<6.0	0.700	<6.0	-0.100	<6.0
Arsenic	3.0	2.1	-0.800	<3.0	-0.200	<3.0	0.100	<3.0	0.100	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.100	<3.0	0.100	<3.0	0.100	<3.0	0.00	<3.0
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	0.00	<50	0.200	<50	0.200	<50	0.200	<50
Copper	10	.8	1.40	<10	1.50	<10	1.40	<10	0.600	<10
Iron	100	5.3	1.00	<100	1.90	<100	0.700	<100	-0.100	<100
Lead	3.0	1.1	-1.30	<3.0	-0.600	<3.0	-0.700	<3.0	-0.600	<3.0
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	0.100	<15	0.100	<15	0.00	<15	0.100	<15
Molybdenum	20	.6								
Nickel	10	.4	0.00	<10	0.400	<10	0.200	<10	0.100	<10
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	-0.600	<10	0.500	<10	0.600	<10	0.500	<10
Silicon	200	1.7								
Silver	10	1	1.50	<10	2.60	<10	2.90	<10	0.800	<10
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	0.200	<10	0.800	<10	-0.400	<10	-0.700	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:			10:17 CCB4		11:15 CCB5		12:14 CCB6		13:07 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	-1.70	<20	-1.60	<20	-1.60	<20	-1.60	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

6.5.3

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:				14:06 CCB8	14:50 CCB9	
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	17	anr			
Antimony	6.0	1.7	1.40	<6.0	-0.400	<6.0
Arsenic	3.0	2.1	-0.400	<3.0	0.300	<3.0
Barium	200	.8	anr			
Beryllium	1.0	.3	anr			
Bismuth	20	2.3				
Boron	100	2.3				
Cadmium	3.0	.3	0.00	<3.0	-0.100	<3.0
Calcium	5000	6.6	anr			
Cerium	100					
Chromium	10	.3	anr			
Cobalt	50	.4	0.100	<50	0.00	<50
Copper	10	.8	0.100	<10	0.100	<10
Iron	100	5.3	-1.10	<100	-0.800	<100
Lead	3.0	1.1	-0.300	<3.0	-0.600	<3.0
Lithium	50	4.8				
Magnesium	5000	32	anr			
Manganese	15	.1	0.100	<15	0.100	<15
Molybdenum	20	.6				
Nickel	10	.4	0.00	<10	0.100	<10
Phosphorus	50	1.2				
Potassium	10000	77	anr			
Selenium	10	3.2	-0.700	<10	-2.10	<10
Silicon	200	1.7				
Silver	10	1	0.00	<10	-0.100	<10
Sodium	10000	34	anr			
Strontium	10	.3				
Sulfur	50	3				
Thallium	10	1.8	-0.700	<10	-1.10	<10
Tin	10	.8				
Titanium	10	.5				
Tungsten	50	2.6				
Vanadium	50	.6	anr			

BLANK RESULTS SUMMARY  
 Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: result < RL Run ID: MA53204 Units: ug/l

Time: Sample ID:			14:06 CCB8		14:50 CCB9	
Metal	RL	IDL	raw	final	raw	final

Zinc	20	.1	-1.60	<20	-1.60	<20
Zirconium	10	.3				
(*) Outside of QC limits						
(anr) Analyte not requested						

6.5.3

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CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA53204 Units: ug/l

Time: Sample ID:		07:26 ICCV1		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	2000	1970	98.5	
Arsenic	2000	1950	97.5	
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	2000	1990	99.5	
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	2000	1980	99.0	
Copper	2000	1970	98.5	
Iron	40000	39100	97.8	
Lead	2000	1980	99.0	
Lithium				
Magnesium	anr			
Manganese	2000	1990	99.5	
Molybdenum				
Nickel	2000	1980	99.0	
Phosphorus				
Potassium	anr			
Selenium	2000	1980	99.0	
Silicon				
Silver	250	241	96.4	
Sodium	anr			
Strontium				
Sulfur				
Thallium	2000	2080	104.0	
Tin				
Titanium				
Tungsten				
Vanadium	anr			

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA53204      Units: ug/l

Time:		07:26	
Sample ID:		ICCV	
Metal		True	
		Results	% Rec

Zinc      2000      1990      99.5

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time: Sample ID:		07:06 ICV1		08:25 CCV1		09:18 CCV2			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	1960	98.0	2000	1960	98.0	2000	2000	100.0
Arsenic	2000	1950	97.5	2000	1940	97.0	2000	1970	98.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	1980	99.0	2000	1970	98.5	2000	2030	101.5
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	2000	1970	98.5	2000	1980	99.0	2000	2050	102.5
Copper	2000	1960	98.0	2000	1950	97.5	2000	1970	98.5
Iron	40000	39400	98.5	40000	38500	96.3	40000	38700	96.8
Lead	2000	1970	98.5	2000	1970	98.5	2000	2030	101.5
Lithium									
Magnesium	anr								
Manganese	2000	1970	98.5	2000	1970	98.5	2000	1980	99.0
Molybdenum									
Nickel	2000	1970	98.5	2000	1980	99.0	2000	2030	101.5
Phosphorus									
Potassium	anr								
Selenium	2000	1970	98.5	2000	1970	98.5	2000	2040	102.0
Silicon									
Silver	250	245	98.0	250	240	96.0	250	240	96.0
Sodium	anr								
Strontium									
Sulfur									
Thallium	2000	2030	101.5	2000	2080	104.0	2000	2150	107.5
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time:		07:06		08:25		09:18	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True

Zinc	2000	1980	99.0	2000	1970	98.5	2000	2020	101.0
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Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time: Sample ID:	CCV	10:12 CCV3		CCV	11:10 CCV4		CCV	12:09 CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	1970	98.5	2000	1980	99.0	2000	1990	99.5
Arsenic	2000	1940	97.0	2000	1950	97.5	2000	1940	97.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	1990	99.5	2000	1990	99.5	2000	1970	98.5
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	2000	2020	101.0	2000	2030	101.5	2000	2030	101.5
Copper	2000	1970	98.5	2000	1980	99.0	2000	1970	98.5
Iron	40000	38600	96.5	40000	38700	96.8	40000	38400	96.0
Lead	2000	2000	100.0	2000	2000	100.0	2000	1990	99.5
Lithium									
Magnesium	anr								
Manganese	2000	1970	98.5	2000	1960	98.0	2000	1970	98.5
Molybdenum									
Nickel	2000	2000	100.0	2000	2010	100.5	2000	2000	100.0
Phosphorus									
Potassium	anr								
Selenium	2000	2020	101.0	2000	2030	101.5	2000	2040	102.0
Silicon									
Silver	250	240	96.0	250	242	96.8	250	240	96.0
Sodium	anr								
Strontium									
Sulfur									
Thallium	2000	2180	109.0	2000	2190	109.5	2000	2230	111.5*(a
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time:		10:12		11:10		12:09	
Sample ID:	CCV	CCV3	CCV	CCV4	CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True

Zinc	2000	1980	99.0	2000	1980	99.0	2000	1960	98.0
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Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

6.5.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time: Sample ID:	CCV	13:03 CCV6		CCV	14:01 CCV7		CCV	14:45 CCV8	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	1970	98.5	2000	1960	98.0	2000	1950	97.5
Arsenic	2000	1940	97.0	2000	1950	97.5	2000	1940	97.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	2000	2020	101.0	2000	2030	101.5	2000	2030	101.5
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	2000	2000	100.0	2000	2000	100.0	2000	1990	99.5
Copper	2000	1980	99.0	2000	1980	99.0	2000	1980	99.0
Iron	40000	37900	94.8	40000	37800	94.5	40000	37700	94.3
Lead	2000	1990	99.5	2000	2000	100.0	2000	2000	100.0
Lithium									
Magnesium	anr								
Manganese	2000	2000	100.0	2000	2000	100.0	2000	2000	100.0
Molybdenum									
Nickel	2000	2000	100.0	2000	2000	100.0	2000	2000	100.0
Phosphorus									
Potassium	anr								
Selenium	2000	2020	101.0	2000	2030	101.5	2000	2020	101.0
Silicon									
Silver	250	240	96.0	250	238	95.2	250	238	95.2
Sodium	anr								
Strontium									
Sulfur									
Thallium	2000	2180	109.0	2000	2150	107.5	2000	2140	107.0
Tin									
Titanium									
Tungsten									
Vanadium	anr								

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53204      Units: ug/l

Time:		13:03			14:01			14:45		
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Zinc	2000	2000	100.0	2000	2020	101.0	2000	2020	101.0	
Zirconium										
(*) Outside of QC limits										
(anr) Analyte not requested										

6.5.5  
6



## HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP  
 QC Limits: 90 to 110 % Recovery

Date Analyzed: 10/25/22  
 Run ID: MA53204

Methods: EPA 200.7, SW846 6010D  
 Units: ug/l

Time:		08:00		08:05	
Sample ID:		HSTD	HSTD1	HSTD	HSTD2
Metal	True	Results	% Rec	True	Results % Rec
Aluminum					
Antimony	8000	7720	96.5		
Arsenic	8000	7570	94.6		
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	8000	7400	92.5		
Calcium					
Cerium					
Chromium	anr				
Cobalt	8000	7650	95.6		
Copper	8000	7530	94.1		
Iron				200000	191000 95.5
Lead	8000	7740	96.8		
Lithium					
Magnesium					
Manganese	8000	7680	96.0		
Molybdenum					
Nickel	8000	7630	95.4		
Phosphorus					
Potassium					
Selenium	8000	7700	96.3		
Silicon					
Silver	625	583	93.3		
Sodium					
Strontium					
Sulfur					
Thallium	8000	8120	101.5		
Tin					
Titanium					
Tungsten					
Vanadium	anr				

HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA53204      Units: ug/l

Time:		08:00		08:05		
Sample ID:		HSTD	HSTD1	HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results	% Rec

Zinc      8000      7840      98.0

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53204 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:40 CRID1		07:45 CRI1		10:07 CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0			6.30	105.0		
Arsenic	8.0	20	3.0	3.10	103.3	6.40	80.0	3.10	103.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	1.00	100.0	3.20	106.7	1.00	100.0
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0	3.00	100.0	48.4	96.8	3.00	100.0
Copper	10		2.0			10.4	104.0		
Iron	100	500				96.9	96.9		
Lead	3.0	20	2.5			2.50	83.3		
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	3.00	100.0	15.0	100.0	2.90	96.7
Molybdenum	20								
Nickel	10		4.0	4.30	107.5	9.70	97.0	4.10	102.5
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0			10.0	100.0	4.50	90.0
Silicon	200								
Silver	5.0		2.0			4.90	98.0		
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0			8.70	87.0	2.00	100.0
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53204 Units: ug/l

Time:					07:40		07:45		10:07	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	CRID1	Results	% Rec	CRID2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results

Zinc	20		10	8.50	85.0	18.3	91.5	8.40	84.0	
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Zirconium	10									
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(\*) Outside of QC limits  
 (anr) Analyte not requested

6.5.7

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53204 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:11 CRI2	% Rec	14:30 CRI3	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100	anr			
Antimony	6.0	20	3.0	5.90	98.3	6.30	105.0
Arsenic	8.0	20	3.0	6.40	80.0	7.30	91.3
Barium	200		4.0	anr			
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0	3.00	100.0	3.00	100.0
Calcium	5000	2000	1000	anr			
Cerium							
Chromium	10		2.0	anr			
Cobalt	50		3.0	48.4	96.8	48.2	96.4
Copper	10		2.0	10.5	105.0	10.3	103.0
Iron	100	500		93.1	93.1	94.1	94.1
Lead	3.0	20	2.5	2.80	93.3	2.50	83.3
Lithium	50						
Magnesium	5000	2000	100	anr			
Manganese	15		3.0	15.0	100.0	14.9	99.3
Molybdenum	20						
Nickel	10		4.0	9.80	98.0	9.70	97.0
Phosphorus	50						
Potassium	5000		2000	anr			
Selenium	10	20	5.0	9.50	95.0	9.50	95.0
Silicon	200						
Silver	5.0		2.0	5.00	100.0	4.80	96.0
Sodium	5000		1000	anr			
Strontium	10						
Sulfur	50						
Thallium	10		2.0	8.40	84.0	8.40	84.0
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0	anr			

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53204 Units: ug/l

Time:				14:11		14:30	
Sample ID:	CRI	CRIA	CRID	CRI2		CRI3	
Metal	True	True	True	Results	% Rec	Results	% Rec

Zinc 20 10 18.4 92.0 18.3 91.5

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.5.7

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP      Date Analyzed: 10/25/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA53204      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:50 ICSAB1 Results	% Rec	07:55 ICSAB1 Results	% Rec	14:35 ICSAB2 Results	% Rec	14:40 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	501000	100.2	497000	99.4	495000	99.0	493000	98.6
Antimony		1000	2.30		1010	101.0	2.50		1030	103.0
Arsenic		1000	1.80		999	99.9	0.100		1020	102.0
Barium		500	2.80		488	97.6	2.60		483	96.6
Beryllium		500	0.300		481	96.2	0.200		472	94.4
Bismuth		500	7.50		474	94.8	7.60		482	96.4
Boron		500	-1.60		495	99.0	-2.40		503	100.6
Cadmium		1000	1.40		1020	102.0	1.30		1040	104.0
Calcium	400000	400000	390000	97.5	372000	93.0	385000	96.3	367000	91.8
Cerium			61.4		560*		64.1		552*	
Chromium		500	4.30		489	97.8	4.30		476	95.2
Cobalt		500	0.900		481	96.2	0.900		486	97.2
Copper		500	-7.70		501	100.2	-7.40		491	98.2
Iron	200000	200000	200000	100.0	197000	98.5	193000	96.5	191000	95.5
Lead		1000	1.40		929	92.9	1.50		944	94.4
Lithium		500	-5.10		515	103.0	-5.20		511	102.2
Magnesium	500000	500000	481000	96.2	481000	96.2	471000	94.2	471000	94.2
Manganese		500	9.10		516	103.2	8.60		504	100.8
Molybdenum		500	0.300		462	92.4	0.800		474	94.8
Nickel		1000	2.00		927	92.7	2.10		940	94.0
Phosphorus		500	-6.60		468	93.6	-18.0		495	99.0
Potassium			-591		-561		-524		-492	
Selenium		1000	-2.10		930	93.0	-6.90		947	94.7
Silicon		500	9.40		625	125.0*	12.4		636	127.2*
Silver		1000	3.20		1020	102.0	0.500		993	99.3
Sodium			117		151		177		171	
Strontium		500	-3.30		479	95.8	-3.20		476	95.2
Sulfur		500	-19.4		463	92.6	-22.5		472	94.4
Thallium		1000	1.80		953	95.3	-5.10		987	98.7
Tin		500	-3.70		460	92.0	-3.40		470	94.0
Titanium		500	-1.90		490	98.0	-1.90		478	95.6
Tungsten		500	1.10		456	91.2	3.60		468	93.6
Vanadium		500	-2.50		495	99.0	-2.20		486	97.2

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102522M1.ICP Date Analyzed: 10/25/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA53204 Units: ug/l

Time:				07:50			07:55			14:35			14:40
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc 1000 12.1 937 93.7 12.4 958 95.8

Zirconium 500 3.50 441 88.2 2.60 432 86.4

(\*) Outside of QC limits  
(anr) Analyte not requested

6.5.8

6



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:53	MA53212-STD1	1		STDA
07:58	MA53212-STD2	1		STDB
08:03	MA53212-ICV1	1		
08:11	MA53212-ICB1	1		
08:18	MA53212-ICB2	1		
08:23	MA53212-ICCV1	1		
08:31	MA53212-CCB1	1		
08:35	MA53212-CRID1	1		
08:40	MA53212-CRI1	1		
08:45	MA53212-ICSA1	1		
08:50	MA53212-ICSAB1	1		
08:55	MA53212-HSTD1	1		
09:01	MA53212-HSTD2	1		
09:06	ZZZZZZ	1		
09:11	ZZZZZZ	1		
09:16	MA53212-CRI2	1		
09:20	ZZZZZZ	1		
09:25	MA53212-CCV1	1		
09:30	MA53212-CCB2	1		
09:35	ZZZZZZ	1		
09:40	ZZZZZZ	1		
09:45	MP35862-S1	2		
09:50	MP35862-S2	2		
09:55	JD53458-2	2		
09:59	MP35862-SD1	10		
10:04	ZZZZZZ	2		
10:09	JD53458-4	5		
10:14	JD53458-6	5		
10:19	MA53212-CCV2	1		
10:24	MA53212-CCB3	1		
10:29	JD53458-8	5		
10:33	JD53458-10	2		
10:38	JD53458-12	5		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:43	JD53458-14	5		
10:48	JD53458-16	5		
10:52	JD53458-18	5		
10:57	JD53458-18	25		
11:02	JD53458-20	5		
11:07	JD53458-20	25		
11:11	MA53212-CCV3	1		
11:16	MA53212-CCB4	1		
11:21	JD53458-22	5		
11:26	JD53458-22	25		
11:31	JD53458-24	5		
11:36	JD53458-24	25		
11:40	JD53458-26	5		
11:45	JD53458-28	5		
11:50	JD53458-28	10		
11:55	JD53458-30	5		
11:59	JD53458-32	5		
12:04	MA53212-CCV4	1		
12:09	MA53212-CCB5	1		
12:14	JD53458-34	5		
12:19	JD53458-36	5		
12:24	JD53458-36	10		
12:28	JD53458-38	5		
12:33	JD53458-40	5		
12:38	JD53458-40	10		
12:43	MP35886-S1	1		
12:48	MP35886-S2	1		
12:52	ZZZZZZ	5		
12:57	MA53212-CCV5	1		
13:02	MA53212-CCB6	1		
13:07	ZZZZZZ	5		
13:12	ZZZZZZ	2		
13:17	MP35821-PS1	10		
-----> Last reportable sample/prep for job JD53458				

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:21	MP35886-MB1	1		
13:26	MP35886-B1	1		
13:31	MP35882-S1	1		
13:36	MP35882-S2	1		
13:41	JD54050-1	1		(sample used for QC only; not part of login JD53458)
13:46	MP35882-SD1	5		
13:51	MA53212-CCV6	1		
13:56	MA53212-CCB7	1		
14:01	MP35882-B2	1		
14:05	MP35882-MB2	1		
14:10	ZZZZZZ	1		
14:15	MA53212-CRID2	1		
14:20	MA53212-CRI3	1		
14:25	MA53212-ICSA2	1		
14:30	MA53212-ICSAB2	1		
14:35	ZZZZZZ	5		
14:40	ZZZZZZ	1		
14:45	ZZZZZZ	1		
14:50	MA53212-CCV7	1		
14:55	MA53212-CCB8	1		
----->	Last reportable CCB for job JD53458			
15:00	ZZZZZZ	5		
15:04	ZZZZZZ	1		
15:09	ZZZZZZ	5		
15:14	ZZZZZZ	5		
15:19	ZZZZZZ	5		
15:24	ZZZZZZ	10		
15:29	ZZZZZZ	5		
15:33	ZZZZZZ	5		
15:38	ZZZZZZ	10		
15:43	MA53212-CCV8	1		
15:48	MA53212-CCB9	1		
15:53	ZZZZZZ	1		
15:58	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
Analyst: ND      Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:03	ZZZZZZ	1		
16:08	ZZZZZZ	1		
16:13	ZZZZZZ	1		
16:17	ZZZZZZ	1		
16:22	ZZZZZZ	1		
16:27	MA53212-CCV9	1		
16:32	MA53212-CCB10	1		
16:37	ZZZZZZ	1		
16:42	ZZZZZZ	1		
16:47	ZZZZZZ	1		
16:52	ZZZZZZ	1		
16:57	ZZZZZZ	1		
17:02	ZZZZZZ	1		
17:07	MA53212-CCV10	1		
17:12	MA53212-CCB11	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S	A	C	C	F	P	M	S	A	T	Z
			b	s	d	u	e	b	n	e	g	l	n
08:03	MA53212-ICV1	1	X	X	X	X	X	X	X	X	X	X	X
08:11	MA53212-ICB1	1	X	X	X	X	X	X	X	X	X	X	X
08:18	MA53212-ICB2	1	X	X	X	X	X	X	X	X	X	X	X
08:23	MA53212-ICCV1	1	X	X	X	X	X	X	X	X	X	X	X
08:31	MA53212-CCB1	1	X	X	X	X	X	X	X	X	X	X	X
08:35	MA53212-CRID1	1	X	X	X	X	X	X	X	X	X	X	X
08:40	MA53212-CRI1	1											
08:45	MA53212-ICSA1	1	X	X	X	X	X	X	X	X	X	X	X
08:50	MA53212-ICSAB1	1	X	X	X	X	X	X	X	X	X	X	X
08:55	MA53212-HSTD1	1	X	X	X	X	X	X	X	X	X	X	X
09:01	MA53212-HSTD2	1	X	X	X	X	X	X	X	X	X	X	X
09:06	ZZZZZZ	1											
09:11	ZZZZZZ	1											
09:16	MA53212-CRI2	1	X	X	X	X	X	X	X	X	X	X	X
09:20	ZZZZZZ	1											
09:25	MA53212-CCV1	1	X	X	X	X	X	X	X	X	X	X	X
09:30	MA53212-CCB2	1	X	X	X	X	X	X	X	X	X	X	X
09:35	ZZZZZZ	1											
09:40	ZZZZZZ	1											
09:45	MP35862-S1	2		X	X								
09:50	MP35862-S2	2		X	X								
09:55	JD53458-2	2		X	X								
09:59	MP35862-SD1	10		X	X								
10:04	ZZZZZZ	2											
10:09	JD53458-4	5	X	X	X	X	X	X	X	X	X	X	X
10:14	JD53458-6	5		X	X								
10:19	MA53212-CCV2	1	X	X	X	X	X	X	X	X	X	X	X
10:24	MA53212-CCB3	1	X	X	X	X	X	X	X	X	X	X	X
10:29	JD53458-8	5	X	X	X	X	X	X	X	X	X	X	X
10:33	JD53458-10	2	X	X	X	X	X	X	X	X	X	X	X
10:38	JD53458-12	5	X	X	X	X	X	X	X	X	X	X	X
10:43	JD53458-14	5	X	X	X	X	X	X	X	X	X	X	X
10:48	JD53458-16	5	X	X	X	X	X	X	X	X	X	X	X
		Element:	S	A	C	C	F	P	M	S	A	T	Z
			b	s	d	u	e	b	n	e	g	l	n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C u	F e	P b	M n	S e	A g	T l	Z n
10:52	JD53458-18	5	X			X	X	X	X	X	X		
10:57	JD53458-18	25		X	X			X				X	
11:02	JD53458-20	5	X			X	X	X	X	X	X	X	
11:07	JD53458-20	25		X	X			X				X	
11:11	MA53212-CCV3	1	X	X	X	X	X	X	X	X	X	X	X
11:16	MA53212-CCB4	1	X	X	X	X	X	X	X	X	X	X	X
11:21	JD53458-22	5	X			X	X	X	X	X	X	X	
11:26	JD53458-22	25		X	X			X				X	
11:31	JD53458-24	5	X			X	X	X	X	X	X		
11:36	JD53458-24	25		X	X			X				X	
11:40	JD53458-26	5	X	X	X	X	X	X	X	X	X	X	X
11:45	JD53458-28	5	X			X	X	X	X	X	X	X	
11:50	JD53458-28	10		X	X								
11:55	JD53458-30	5	X	X	X	X	X	X	X	X	X	X	X
11:59	JD53458-32	5	X	X	X	X	X	X	X	X	X	X	X
12:04	MA53212-CCV4	1	X	X	X	X	X	X	X	X	X	X	X
12:09	MA53212-CCB5	1	X	X	X	X	X	X	X	X	X	X	X
12:14	JD53458-34	5	X	X	X	X	X	X	X	X	X	X	X
12:19	JD53458-36	5	X			X	X	X	X	X	X	X	
12:24	JD53458-36	10		X	X							X	
12:28	JD53458-38	5	X	X	X	X	X	X	X	X	X	X	X
12:33	JD53458-40	5	X			X	X	X	X	X	X	X	
12:38	JD53458-40	10		X	X							X	
12:43	MP35886-S1	1										X	
12:48	MP35886-S2	1										X	
12:52	ZZZZZZ	5											
12:57	MA53212-CCV5	1	X	X	X	X	X	X	X	X	X	X	X
13:02	MA53212-CCB6	1	X	X	X	X	X	X	X	X	X	X	X
13:07	ZZZZZZ	5											
13:12	ZZZZZZ	2											
13:17	MP35821-PS1	10								X			
13:21	MP35886-MB1	1										X	
13:26	MP35886-B1	1										X	
Element:			S b	A s	C d	C u	F e	P b	M n	S e	A g	T l	Z n

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	Sb	As	Cd	Cu	Fe	Pb	Mn	Se	Ag	Tl	Zn
13:31	MP35882-S1	1	X	X	X	X	X	X	X	X	X	X	X
13:36	MP35882-S2	1	X	X	X	X	X	X	X	X	X	X	X
13:41	JD54050-1	1		X	X	X		X	X	X	X	X	(a)
13:46	MP35882-SD1	5	X	X	X	X	X	X	X	X	X	X	X
13:51	MA53212-CCV6	1	X	X	X	X	X	X	X	X	X	X	X
13:56	MA53212-CCB7	1	X	X	X	X	X	X	X	X	X	X	X
14:01	MP35882-B2	1	X	X	X	X	X	X	X	X	X	X	X
14:05	MP35882-MB2	1	X	X	X	X	X	X	X	X	X	X	X
14:10	ZZZZZZ	1											
14:15	MA53212-CRID2	1	X	X	X	X	X	X	X	X	X	X	X
14:20	MA53212-CRI3	1	X	X	X	X	X	X	X	X	X	X	X
14:25	MA53212-ICSA2	1	X	X	X	X	X	X	X	X	X	X	X
14:30	MA53212-ICSAB2	1	X	X	X	X	X	X	X	X	X	X	X
14:35	ZZZZZZ	5											
14:40	ZZZZZZ	1											
14:45	ZZZZZZ	1											
14:50	MA53212-CCV7	1	X	X	X	X	X	X	X	X	X	X	X
14:55	MA53212-CCB8	1	X	X	X	X	X	X	X	X	X	X	X
15:00	ZZZZZZ	5											
15:04	ZZZZZZ	1											
15:09	ZZZZZZ	5											
15:14	ZZZZZZ	5											
15:19	ZZZZZZ	5											
15:24	ZZZZZZ	10											
15:29	ZZZZZZ	5											
15:33	ZZZZZZ	5											
15:38	ZZZZZZ	10											
15:43	MA53212-CCV8	1	X	X	X	X	X	X	X	X	X	X	X
15:48	MA53212-CCB9	1	X	X	X	X	X	X	X	X	X	X	X
15:53	ZZZZZZ	1											
15:58	ZZZZZZ	1											
16:03	ZZZZZZ	1											
16:08	ZZZZZZ	1											
		Element:	Sb	As	Cd	Cu	Fe	Pb	Mn	Se	Ag	Tl	Zn

REPORTED ELEMENTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Element: Dilution	S b	A s	C d	C u	F e	P b	M n	S e	A g	T l	Z n
16:13	ZZZZZZ	1											
16:17	ZZZZZZ	1											
16:22	ZZZZZZ	1											
16:27	MA53212-CCV9	1	X	X	X	X	X	X	X	X	X	X	X
16:32	MA53212-CCB10	1	X	X	X	X	X	X	X	X	X	X	X
16:37	ZZZZZZ	1											
16:42	ZZZZZZ	1											
16:47	ZZZZZZ	1											
16:52	ZZZZZZ	1											
16:57	ZZZZZZ	1											
17:02	ZZZZZZ	1											
17:07	MA53212-CCV10	1	X	X	X	X	X	X	X	X	X	X	X
17:12	MA53212-CCB11	1	X	X	X	X	X	X	X	X	X	X	X
(a) Sample used for QC only; not part of login JD53458.													

Element: S A C C F P M S A T Z  
b s d u e b n e g l n



## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:53	MA53212-STD1	7773 R	188340 R	13507 R	12701 R
07:58	MA53212-STD2	7356	175180	13239	11159
08:03	MA53212-ICV1	7633	182050	13409	11681
08:11	MA53212-ICB1	7701	185990	13186	12590
08:18	MA53212-ICB2	7749	188270	13274	12672
08:23	MA53212-ICCV1	7558	180480	13209	11559
08:31	MA53212-CCB1	7688	185880	13076	12551
08:35	MA53212-CRID1	7744	187020	13169	12600
08:40	MA53212-CRI1	No results reported for the elements associated with this internal standard.			
08:45	MA53212-ICSA1	6989	164720	12836	10287
08:50	MA53212-ICSAB1	6967	164720	12593	10287
08:55	MA53212-HSTD1	7617	182870	13281	12302
09:01	MA53212-HSTD2	7105	168110	12852	10412
09:06	ZZZZZZ	7750	186800	13192	12598
09:11	ZZZZZZ	7626	188120	13243	12643
09:16	MA53212-CRI2	7744	188650	13205	12442
09:20	ZZZZZZ	7759	187780	13197	12623
09:25	MA53212-CCV1	7679	182900	13262	11704
09:30	MA53212-CCB2	7871	190120	13234	12785
09:35	ZZZZZZ	7928	191410	13528	12859
09:40	ZZZZZZ	7721	184680	13361	11951
09:45	MP35862-S1	7926	187600	13746	11994
09:50	MP35862-S2	7912	186990	13682	11967
09:55	JD53458-2	8049	190900	13729	12386
09:59	MP35862-SD1	8001	191030	13446	12705
10:04	ZZZZZZ	7947	188420	13675	12083
10:09	JD53458-4	7985	190310	13521	12389
10:14	JD53458-6	7949	189400	13585	12358
10:19	MA53212-CCV2	7623	184210	13201	11621
10:24	MA53212-CCB3	7841	189730	13234	12750
10:29	JD53458-8	7926	188930	13509	12333
10:33	JD53458-10	8009	189840	13968	12234
10:38	JD53458-12	7944	190030	13617	12470

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:43	JD53458-14	7985	187850	13635	12429
10:48	JD53458-16	7993	190160	13615	12466
10:52	JD53458-18	7901	188330	13676	12048
10:57	JD53458-18	7920	189830	13380	12553
11:02	JD53458-20	7829	187920	13564	11974
11:07	JD53458-20	7883	188680	13345	12493
11:11	MA53212-CCV3	7662	182730	13233	11674
11:16	MA53212-CCB4	7884	190810	13280	12815
11:21	JD53458-22	7892	189400	13728	11936
11:26	JD53458-22	7889	190260	13414	12462
11:31	JD53458-24	8017	190620	13828	12169
11:36	JD53458-24	7954	191560	13470	12591
11:40	JD53458-26	8012	192230	13953	12423
11:45	JD53458-28	7971	190830	13795	12248
11:50	JD53458-28	7960	191230	13671	12468
11:55	JD53458-30	7999	191510	13913	12514
11:59	JD53458-32	7937	190910	13762	12324
12:04	MA53212-CCV4	7637	182410	13242	11694
12:09	MA53212-CCB5	7745	187720	12954	12668
12:14	JD53458-34	7949	188880	13479	12336
12:19	JD53458-36	7894	187780	13547	12103
12:24	JD53458-36	7840	188070	13293	12256
12:28	JD53458-38	7941	187690	13498	12267
12:33	JD53458-40	7899	187680	13448	12151
12:38	JD53458-40	7825	185740	13037	12249
12:43	MP35886-S1	7716	183430	13191	11777
12:48	MP35886-S2	7727	184350	13313	11817
12:52	ZZZZZZ	7835	187610	13057	12544
12:57	MA53212-CCV5	7638	181240	12936	11590
13:02	MA53212-CCB6	7840	189740	13104	12706
13:07	ZZZZZZ	7823	186320	12991	12221
13:12	ZZZZZZ	7943	187930	13423	12058
13:17	MP35821-PS1	7715	186710	13117	12170

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA53212  
Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:21	MP35886-MB1	7923	191700	13236	12824
13:26	MP35886-B1	7716	183990	13121	11896
13:31	MP35882-S1	7611	180250	13125	11547
13:36	MP35882-S2	7549	177330	12916	11476
13:41	JD54050-1	7650	181460	13055	11843
13:46	MP35882-SD1	7800	186400	13124	12407
13:51	MA53212-CCV6	7651	180980	12926	11597
13:56	MA53212-CCB7	7843	188640	12959	12674
14:01	MP35882-B2	7711	181710	13041	11966
14:05	MP35882-MB2	7821	186280	12926	12799
14:10	ZZZZZZ	7776	186270	12888	12426
14:15	MA53212-CRID2	7844	188020	12969	12673
14:20	MA53212-CRI3	7797	187320	12995	12459
14:25	MA53212-ICSA2	7165	168430	12749	10467
14:30	MA53212-ICSAB2	7119	167790	12649	10426
14:35	ZZZZZZ	7508	178710	12736	11478
14:40	ZZZZZZ	7809	186610	12875	12782
14:45	ZZZZZZ	7837	186150	12900	12826
14:50	MA53212-CCV7	7683	182450	12969	11636
14:55	MA53212-CCB8	7847	188620	12884	12682
15:00	ZZZZZZ	7582	179950	12827	11458
15:04	ZZZZZZ	7699	181290	13317	11065
15:09	ZZZZZZ	7825	186970	13127	11976
15:14	ZZZZZZ	7607	181150	12954	11506
15:19	ZZZZZZ	7884	188940	13124	12404
15:24	ZZZZZZ	7585	181280	12735	11709
15:29	ZZZZZZ	7810	185290	13080	11866
15:33	ZZZZZZ	7750	184770	12995	11806
15:38	ZZZZZZ	7688	183410	12866	11835
15:43	MA53212-CCV8	7698	182440	12878	11638
15:48	MA53212-CCB9	7853	188930	12862	12675
15:53	ZZZZZZ	7430	177680	12614	11486
15:58	ZZZZZZ	7580	179020	12524	12012

## INTERNAL STANDARD SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA53212  
 Parameters: Sb,As,Cd,Cu,Fe,Pb,Mn,Se,Ag,Tl,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:03	ZZZZZZ	7572	180380	12800	11795
16:08	ZZZZZZ	7653	182580	13058	11653
16:13	ZZZZZZ	7656	183040	13095	11913
16:17	ZZZZZZ	7556	180430	13028	11650
16:22	ZZZZZZ	7722	183520	13011	12004
16:27	MA53212-CCV9	7649	182200	13000	11610
16:32	MA53212-CCB10	7741	186580	12764	12560
16:37	ZZZZZZ	7787	186730	12794	12571
16:42	ZZZZZZ	7654	186090	12787	12355
16:47	ZZZZZZ	7786	188000	12829	12666
16:52	ZZZZZZ	7819	187760	12889	12602
16:57	ZZZZZZ	7853	189170	12996	12649
17:02	ZZZZZZ	7919	190220	13117	12756
17:07	MA53212-CCV10	7731	184240	13051	11689
17:12	MA53212-CCB11	7923	191360	13120	12792

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:			08:11 ICB1		08:18 ICB2		08:31 CCB1		09:30 CCB2	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	0.100	<6.0	0.00	<6.0	0.200	<6.0	1.00	<6.0
Arsenic	3.0	2.1	0.100	<3.0	0.200	<3.0	-0.300	<3.0	0.300	<3.0
Barium	200	.8								
Beryllium	1.0	.3								
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.00	<3.0	0.00	<3.0	0.00	<3.0	0.00	<3.0
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4								
Copper	10	.8	-0.300	<10	-0.100	<10	-0.200	<10	-0.700	<10
Iron	100	5.3	1.80	<100	-0.600	<100	2.50	<100	4.90	<100
Lead	3.0	1.1	-1.10	<3.0	-1.00	<3.0	-0.600	<3.0	-0.700	<3.0
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	0.00	<15	0.00	<15	0.200	<15	0.100	<15
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2	0.00	<10	-0.400	<10	-1.50	<10	0.800	<10
Silicon	200	1.7								
Silver	10	1	-0.200	<10	-0.500	<10	-0.200	<10	-0.600	<10
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	0.300	<10	0.500	<10	-0.900	<10	-0.300	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:			08:11 ICB1		08:18 ICB2		08:31 CCB1		09:30 CCB2	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	-0.200	<20	0.600	<20	0.700	<20	-0.300	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

6.6.3

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:			10:24 CCB3		11:16 CCB4		12:09 CCB5		13:02 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	0.600	<6.0	0.500	<6.0	0.300	<6.0	-0.400	<6.0
Arsenic	3.0	2.1	1.00	<3.0	0.100	<3.0	-0.300	<3.0	0.200	<3.0
Barium	200	.8								
Beryllium	1.0	.3								
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	0.00	<3.0	0.00	<3.0	0.200	<3.0	0.200	<3.0
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4								
Copper	10	.8	-0.500	<10	-0.200	<10	-0.500	<10	-0.900	<10
Iron	100	5.3	3.60	<100	1.30	<100	5.70	<100	3.80	<100
Lead	3.0	1.1	-1.40	<3.0	-0.500	<3.0	-0.100	<3.0	-0.500	<3.0
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	0.100	<15	0.100	<15	0.100	<15	0.100	<15
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2	0.400	<10	-0.700	<10	-0.500	<10	1.00	<10
Silicon	200	1.7								
Silver	10	1	-0.500	<10	-0.100	<10	-0.400	<10	-0.500	<10
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	0.900	<10	-0.300	<10	0.00	<10	0.00	<10
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:			10:24 CCB3		11:16 CCB4		12:09 CCB5		13:02 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	-0.600	<20	0.800	<20	0.100	<20	0.100	<20
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

6.6.3

6



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:				13:56 CCB7			14:55 CCB8		
Metal	RL	IDL	raw	final	raw	final	raw	final	
Aluminum	200	17	anr						
Antimony	6.0	1.7	0.400	<6.0	0.700	<6.0			
Arsenic	3.0	2.1	1.20	<3.0	0.500	<3.0			
Barium	200	.8							
Beryllium	1.0	.3							
Bismuth	20	2.3							
Boron	100	2.3							
Cadmium	3.0	.3	0.300	<3.0	0.100	<3.0			
Calcium	5000	6.6	anr						
Cerium	100								
Chromium	10	.3	anr						
Cobalt	50	.4							
Copper	10	.8	-0.900	<10	-0.600	<10			
Iron	100	5.3	1.00	<100	5.60	<100			
Lead	3.0	1.1	-0.800	<3.0	-1.40	<3.0			
Lithium	50	4.8							
Magnesium	5000	32	anr						
Manganese	15	.1	0.100	<15	0.100	<15			
Molybdenum	20	.6							
Nickel	10	.4	anr						
Phosphorus	50	1.2							
Potassium	10000	77							
Selenium	10	3.2	0.400	<10	-1.50	<10			
Silicon	200	1.7							
Silver	10	1	-0.300	<10	-2.10	<10			
Sodium	10000	34							
Strontium	10	.3							
Sulfur	50	3							
Thallium	10	1.8	-0.500	<10	-0.800	<10			
Tin	10	.8							
Titanium	10	.5							
Tungsten	50	2.6							
Vanadium	50	.6							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA53212 Units: ug/l

Time: Sample ID:			13:56 CCB7		14:55 CCB8	
Metal	RL	IDL	raw	final	raw	final

Zinc	20	.1	-0.300	<20	0.100	<20
Zirconium	10	.3				
(*) Outside of QC limits						
(anr) Analyte not requested						

6.6.3

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA53212 Units: ug/l

Time: Sample ID:		08:23 ICCV1		
Metal	True	Results	% Rec	
Aluminum	anr			
Antimony	2000	1960	98.0	
Arsenic	2000	1960	98.0	
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	2000	2050	102.5	
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt				
Copper	2000	2010	100.5	
Iron	40000	40000	100.0	
Lead	2000	2030	101.5	
Lithium				
Magnesium	anr			
Manganese	2000	2050	102.5	
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	2000	2020	101.0	
Silicon				
Silver	250	244	97.6	
Sodium				
Strontium				
Sulfur				
Thallium	2000	2090	104.5	
Tin				
Titanium				
Tungsten				
Vanadium				

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA53212      Units: ug/l

Time:		08:23
Sample ID:		ICCV
Metal		True
		Results
		% Rec

Zinc      2000      2040      102.0

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time: Sample ID:		08:03 ICV1	% Rec	09:25 CCV1	% Rec	10:19 CCV2	% Rec
Metal	ICV True	Results		CCV True	Results	Results	
Aluminum	anr						
Antimony	2000	1930	96.5	2000	1890	94.5	2000 1930 96.5
Arsenic	2000	1920	96.0	2000	1900	95.0	2000 1930 96.5
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium	2000	1960	98.0	2000	1980	99.0	2000 2000 100.0
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt							
Copper	2000	1940	97.0	2000	1940	97.0	2000 1930 96.5
Iron	40000	39200	98.0	40000	38500	96.3	40000 38800 97.0
Lead	2000	1940	97.0	2000	1970	98.5	2000 1990 99.5
Lithium							
Magnesium	anr						
Manganese	2000	1960	98.0	2000	1980	99.0	2000 1980 99.0
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	2000	1940	97.0	2000	1930	96.5	2000 1970 98.5
Silicon							
Silver	250	244	97.6	250	236	94.4	250 236 94.4
Sodium							
Strontium							
Sulfur							
Thallium	2000	2000	100.0	2000	1990	99.5	2000 2050 102.5
Tin							
Titanium							
Tungsten							
Vanadium							

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time:		08:03		09:25		10:19	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True

Zinc	2000	1960	98.0	2000	1970	98.5	2000	2000	100.0
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Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time: Sample ID:		11:11 CCV3		12:04 CCV4		12:57 CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	2000	1920	96.0	2000	1910	95.5	2000	1890	94.5
Arsenic	2000	1920	96.0	2000	1910	95.5	2000	1900	95.0
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium	2000	1990	99.5	2000	1990	99.5	2000	2000	100.0
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt									
Copper	2000	1950	97.5	2000	1950	97.5	2000	1960	98.0
Iron	40000	38600	96.5	40000	38700	96.8	40000	38500	96.3
Lead	2000	1990	99.5	2000	1970	98.5	2000	2010	100.5
Lithium									
Magnesium	anr								
Manganese	2000	1980	99.0	2000	1990	99.5	2000	1990	99.5
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium									
Selenium	2000	1970	98.5	2000	1960	98.0	2000	1950	97.5
Silicon									
Silver	250	239	95.6	250	238	95.2	250	237	94.8
Sodium									
Strontium									
Sulfur									
Thallium	2000	2040	102.0	2000	2020	101.0	2000	2080	104.0
Tin									
Titanium									
Tungsten									
Vanadium									

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time:		11:11			12:04			12:57		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc	2000	1990	99.5	2000	1990	99.5	2000	2000	100.0	
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Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.5

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time: Sample ID:		13:51 CCV6	% Rec	14:50 CCV7	% Rec
Metal	True	Results		True	Results
Aluminum	anr				
Antimony	2000	1870	93.5	2000	1850
Arsenic	2000	1880	94.0	2000	1860
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	2000	1980	99.0	2000	1960
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt					
Copper	2000	1940	97.0	2000	1920
Iron	40000	38100	95.3	40000	37800
Lead	2000	1990	99.5	2000	1980
Lithium					
Magnesium	anr				
Manganese	2000	1990	99.5	2000	1960
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	2000	1930	96.5	2000	1910
Silicon					
Silver	250	235	94.0	250	232
Sodium					
Strontium					
Sulfur					
Thallium	2000	2070	103.5	2000	2050
Tin					
Titanium					
Tungsten					
Vanadium					

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA53212      Units: ug/l

Time:		13:51		14:50		
Sample ID:	CCV	CCV6		CCV	CCV7	
Metal	True	Results	% Rec	True	Results	% Rec

Zinc	2000	1980	99.0	2000	1960	98.0
------	------	------	------	------	------	------

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

## HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 10/26/22  
Run ID: MA53212

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		08:55		09:01	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	HSTD	Results
	True			True	% Rec
Aluminum					
Antimony	8000	7620	95.3		
Arsenic	8000	7560	94.5		
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	8000	7450	93.1		
Calcium					
Cerium					
Chromium	anr				
Cobalt					
Copper	8000	7650	95.6		
Iron				200000	194000
Lead	8000	7730	96.6		97.0
Lithium					
Magnesium					
Manganese	8000	7750	96.9		
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	8000	7660	95.8		
Silicon					
Silver	625	595	95.2		
Sodium					
Strontium					
Sulfur					
Thallium	8000	7810	97.6		
Tin					
Titanium					
Tungsten					
Vanadium					

# HIGH STANDARD CHECK SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA53212 Units: ug/l

Time:		08:55		09:01	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc 8000 7910 98.9

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53212 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	08:35 CRID1		09:16 CRI2		14:15 CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0			5.80	96.7		
Arsenic	8.0	20	3.0	3.50	116.7	7.80	97.5	3.30	110.0
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	1.10	110.0	3.20	106.7	0.900	90.0
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0			9.40	94.0		
Iron	100	500				104	104.0		
Lead	3.0	20	2.5			3.00	100.0		
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	3.00	100.0	15.0	100.0	2.90	96.7
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0	4.20	84.0	9.60	96.0	5.80	116.0
Silicon	200								
Silver	5.0		2.0			4.40	88.0		
Sodium	5000		1000						
Strontium	10								
Sulfur	50								
Thallium	10		2.0			10.7	107.0	2.00	100.0
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53212 Units: ug/l

Time:					08:35		09:16		14:15	
Sample ID:	CRI	CRIA	CRID	CRID1			CRI2		CRID2	
Metal	True	True	True	Results	% Rec		Results	% Rec	Results	% Rec

Zinc	20		10	9.80	98.0		19.5	97.5	9.20	92.0
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Zirconium	10									
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(\*) Outside of QC limits  
 (anr) Analyte not requested

6.6.7

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53212 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:20 CRI3	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100	anr	
Antimony	6.0	20	3.0	6.30	105.0
Arsenic	8.0	20	3.0	8.40	105.0
Barium	200		4.0		
Beryllium	2.0		1.0		
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	3.00	100.0
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	
Cobalt	50		3.0		
Copper	10		2.0	8.90	89.0
Iron	100	500		98.2	98.2
Lead	3.0	20	2.5	2.40	80.0
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	15.0	100.0
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000		
Selenium	10	20	5.0	10.1	101.0
Silicon	200				
Silver	5.0		2.0	4.50	90.0
Sodium	5000		1000		
Strontium	10				
Sulfur	50				
Thallium	10		2.0	10.5	105.0
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0		

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA53212 Units: ug/l

Time:				14:20	
Sample ID:	CRI	CRIA	CRID	CRI3	
Metal	True	True	True	Results	% Rec

Zinc 20 10 19.3 96.5

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.6.7

6



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP      Date Analyzed: 10/26/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA53212      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	08:45 ICSAB1 Results	% Rec	08:50 ICSAB1 Results	% Rec	14:25 ICSAB2 Results	% Rec	14:30 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	505000	101.0	513000	102.6	483000	96.6	481000	96.2
Antimony		1000	-1.80		996	99.6	-4.30		936	93.6
Arsenic		1000	0.900		997	99.7	2.30		942	94.2
Barium		500	2.80		496	99.2	3.00		472	94.4
Beryllium		500	0.300		494	98.8	0.200		469	93.8
Bismuth		500	7.00		495	99.0	5.10		467	93.4
Boron		500	-1.70		479	95.8	-1.90		451	90.2
Cadmium		1000	1.20		1030	103.0	0.900		984	98.4
Calcium	400000	400000	399000	99.8	383000	95.8	381000	95.3	368000	92.0
Cerium			71.8		571*		72.1		556*	
Chromium		500	4.60		478	95.6	4.30		459	91.8
Cobalt		500	0.900		481	96.2	1.20		461	92.2
Copper		500	-4.00		494	98.8	-2.80		473	94.6
Iron	200000	200000	201000	100.5	203000	101.5	190000	95.0	188000	94.0
Lead		1000	2.97		925	92.5	0.600		900	90.0
Lithium		500	-8.30		537	107.4	-8.80		504	100.8
Magnesium	500000	500000	485000	97.0	498000	99.6	464000	92.8	466000	93.2
Manganese		500	8.70		511	102.2	8.10		490	98.0
Molybdenum		500	-0.100		463	92.6	0.00		441	88.2
Nickel		1000	1.60		932	93.2	1.50		899	89.9
Phosphorus		500	-2.20		463	92.6	-1.00		446	89.2
Potassium			-627		-612		-634		-582	
Selenium		1000	-7.80		918	91.8	-9.70		863	86.3
Silicon		500	5.00		474	94.8	6.50		455	91.0
Silver		1000	1.90		991	99.1	-1.30		943	94.3
Sodium			107		130		27.4		59.7	
Strontium		500	-3.40		488	97.6	-3.30		461	92.2
Sulfur		500	-16.0		468	93.6	-16.2		449	89.8
Thallium		1000	5.00		917	91.7	5.40		903	90.3
Tin		500	-2.80		460	92.0	-3.00		438	87.6
Titanium		500	-1.80		474	94.8	-2.10		449	89.8
Tungsten		500	-1.80		455	91.0	0.00		435	87.0
Vanadium		500	-2.40		485	97.0	-2.10		466	93.2

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC102622M1.ICP Date Analyzed: 10/26/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA53212 Units: ug/l

Time:				08:45			08:50			14:25			14:30
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc 1000 2.90 936 93.6 2.90 898 89.8

Zirconium 500 2.00 434 86.8 0.900 422 84.4

(\*) Outside of QC limits  
(anr) Analyte not requested

6.6.8  
6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35746  
Matrix Type: AQUEOUS

Methods: SW846 7470A  
Units: ug/l

Prep Date: 10/13/22

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.20	.024	.095	-0.0063	<0.20

Associated samples MP35746: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35746  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/13/22

Metal	JD53458-1F Original MS	Spikelot HGPW3	% Rec	QC Limits
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Mercury 0.0 1.3 2 65.0N(a) 75-125

Associated samples MP35746: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35746  
 Matrix Type: AQUEOUS

Methods: SW846 7470A  
 Units: ug/l

Prep Date: 10/13/22

Metal	JD53458-1F Original MSD	Spikelot HGPW3	% Rec	MSD RPD	QC Limit
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Mercury	0.0	1.2	2	60.0N(a)	8.0	20
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Associated samples MP35746: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference.

## 6.7.3



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/17/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7	-0.30	<6.0
Arsenic	3.0	2.1	2.8	-0.20	<3.0
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1	-0.10	<3.0
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6	-0.10	<50
Copper	10	.8	5.9	2.8	<10
Iron	100	5.3	32	7.6	<100
Lead	3.0	1.1	1.8	1.2	<3.0
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4	0.40	<15
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7	0.30	<10
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9	-0.80	<10
Silicon	200	1.7	32		
Silver	10	1	6.1	0.60	<10
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8	-0.40	<10
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/17/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9	2.4	<20
Zirconium	10	.3	4.1		

Associated samples MP35770: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F Original MS		Spikelet MPSPK2	% Rec	QC Limits
Aluminum					
Antimony	0.0	1810	2000	90.5	75-125
Arsenic	2.3	1830	2000	91.4	75-125
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	0.50	1830	2000	91.5	75-125
Calcium					
Cerium					
Chromium					
Cobalt	0.40	1830	2000	91.5	75-125
Copper	1.7	1750	2000	87.4	75-125
Iron	134	22900	25000	91.1	75-125
Lead	0.0	1800	2000	90.0	75-125
Lithium					
Magnesium					
Manganese	18.7	1790	2000	88.6	75-125
Molybdenum					
Nickel	3.0	1820	2000	90.9	75-125
Phosphorus					
Potassium					
Selenium	0.0	1830	2000	91.5	75-125
Silicon					
Silver	0.0	220	250	88.0	75-125
Strontium					
Sulfur					
Thallium	0.0	1820	2000	91.0	75-125
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc	40.8	1820	2000	89.0	75-125

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP35770: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.0	1920	2000	96.0	5.9	20
Arsenic	2.3	1930	2000	96.4	5.3	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium	0.50	1940	2000	97.0	5.8	20
Calcium						
Cerium						
Chromium						
Cobalt	0.40	1940	2000	97.0	5.8	20
Copper	1.7	1880	2000	93.9	7.2	20
Iron	134	24200	25000	96.3	5.5	20
Lead	0.0	1920	2000	96.0	6.5	20
Lithium						
Magnesium						
Manganese	18.7	1900	2000	94.1	6.0	20
Molybdenum						
Nickel	3.0	1940	2000	96.9	6.4	20
Phosphorus						
Potassium						
Selenium	0.0	1940	2000	97.0	5.8	20
Silicon						
Silver	0.0	235	250	94.0	6.6	20
Strontium						
Sulfur						
Thallium	0.0	1930	2000	96.5	5.9	20
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	40.8	1920	2000	94.0	5.3	20

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP35770: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/17/22

10/17/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSD Result	Spikelot MPSPK2	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony	1850	2000	92.5	80-120	1830	2000	91.5	1.1	20
Arsenic	1830	2000	91.5	80-120	1810	2000	90.5	1.1	20
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium	1850	2000	92.5	80-120	1840	2000	92.0	0.5	20
Calcium									
Cerium									
Chromium									
Cobalt	1830	2000	91.5	80-120	1810	2000	90.5	1.1	20
Copper	1820	2000	91.0	80-120	1800	2000	90.0	1.1	20
Iron	23500	25000	94.0	80-120	22900	25000	91.6	2.6	20
Lead	1820	2000	91.0	80-120	1810	2000	90.5	0.6	20
Lithium									
Magnesium									
Manganese	1810	2000	90.5	80-120	1770	2000	88.5	2.2	20
Molybdenum									
Nickel	1830	2000	91.5	80-120	1810	2000	90.5	1.1	20
Phosphorus									
Potassium									
Selenium	1840	2000	92.0	80-120	1850	2000	92.5	0.5	20
Silicon									
Silver	222	250	88.8	80-120	220	250	88.0	0.9	20
Sodium									
Strontium									
Sulfur									
Thallium	1900	2000	95.0	80-120	1890	2000	94.5	0.5	20
Tin									
Titanium									
Tungsten									
Vanadium									

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date:

10/17/22

10/17/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits	BSD Result	Spikelot MPSPK2	% Rec	BSD RPD	QC Limit
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Zinc	1840	2000	92.0	80-120	1820	2000	91.0	1.1	20
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Zirconium

Associated samples MP35770: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	0.00	0.00	NC	0-10
Arsenic	2.30	0.00	100.0(a)	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	0.500	0.00	100.0(a)	0-10
Calcium				
Cerium				
Chromium				
Cobalt	0.400	0.00	100.0(a)	0-10
Copper	1.70	0.00	100.0(a)	0-10
Iron	134	116	13.4 (a)	0-10
Lead	0.00	6.00	NC	0-10
Lithium				
Magnesium				
Manganese	18.7	18.8	0.5	0-10
Molybdenum				
Nickel	3.00	0.00	100.0(a)	0-10
Phosphorus				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Sulfur				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35770  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/17/22

Metal	JD53407-2F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc	40.8	39.1	4.2	0-10
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Zirconium

Associated samples MP35770: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35807  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 10/17/22

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.033	.004	.015	-0.0049	<0.033

Associated samples MP35807: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35807  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/17/22

Metal	JD53458-2 Original MS	Spikelot HGPWS1	% Rec	QC Limits
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Mercury 2.3 2.7 0.505 79.3 (a) 80-120

Associated samples MP35807: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35807  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/17/22

Metal	JD53458-2 Original MSD	Spikelot HGPWS1	% Rec	MSD RPD	QC Limit
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Mercury 2.3 13.0 0.447 2395.5(a) 131.2 (b)20

Associated samples MP35807: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) High rpd due to possible sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35807  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/17/22 10/17/22

Metal	BSP Result	Spikelot HGPWS1	% Rec	QC Limits	LCS Result	Spikelot HGLC540112	% Rec	QC Limits
Mercury	0.33	0.333	99.0	80-120	8.0	11	72.7	64-118

Associated samples MP35807: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/19/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7	1.7	<6.0
Arsenic	3.0	2.1	2.8	0.30	<3.0
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1	-0.10	<3.0
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6	-0.20	<50
Copper	10	.8	5.9	2.8	<10
Iron	100	5.3	32	11.2	<100
Lead	3.0	1.1	1.8	0.80	<3.0
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4	0.30	<15
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7	0.50	<10
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9	0.0	<10
Silicon	200	1.7	32		
Silver	10	1	6.1	1.1	<10
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8	-1.2	<10
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/19/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9	5.0	<20
Zirconium	10	.3	4.1		

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F Original MS		SpikeLot MPSPK2	% Rec	QC Limits
Aluminum	anr				
Antimony	87.2	1990	2000	95.1	75-125
Arsenic	75300	70900	2000	-220.0(a)	75-125
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	62.6	2000	2000	96.9	75-125
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	0.0	1830	2000	91.5	75-125
Copper	4.0	1920	2000	95.8	75-125
Iron	54.4	23100	25000	92.2	75-125
Lead	0.0	1890	2000	94.5	75-125
Lithium					
Magnesium	anr				
Manganese	86.5	1970	2000	94.8	75-125
Molybdenum					
Nickel	6.4	1820	2000	90.7	75-125
Phosphorus					
Potassium	anr				
Selenium	0.0	1470	2000	73.5N(b)	75-125
Silicon					
Silver	10.3	239	250	94.8	75-125
Sodium	anr				
Strontium					
Sulfur					
Thallium	0.0	2030	2000	101.5	75-125
Tin					
Titanium					
Tungsten					
Vanadium	anr				

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F Original MS	Spikelot MPSPK2	% Rec	QC Limits
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Zinc 0.50 1790 2000 89.5 75-125

Zirconium

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) Spike recovery indicates possible matrix interference.



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	87.2	1950	2000	93.1	2.0	20
Arsenic	75300	69700	2000	-280.0(a)	1.7	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	62.6	1950	2000	94.4	2.5	20
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	0.0	1810	2000	90.5	1.1	20
Copper	4.0	1830	2000	91.3	4.8	20
Iron	54.4	22400	25000	89.4	3.1	20
Lead	0.0	1840	2000	92.0	2.7	20
Lithium						
Magnesium	anr					
Manganese	86.5	1870	2000	89.8	5.2	20
Molybdenum						
Nickel	6.4	1800	2000	89.7	1.1	20
Phosphorus						
Potassium	anr					
Selenium	0.0	1450	2000	72.5N(b)	1.4	20
Silicon						
Silver	10.3	228	250	90.4	4.7	20
Sodium	anr					
Strontium						
Sulfur						
Thallium	0.0	1970	2000	98.5	3.0	20
Tin						
Titanium						
Tungsten						
Vanadium	anr					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc	0.50	1770	2000	88.5	1.1	20
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Zirconium

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) Spike recovery indicates possible matrix interference.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 10/19/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	1770	2000	88.5	80-120
Arsenic	1750	2000	87.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	1790	2000	89.5	80-120
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	1760	2000	88.0	80-120
Copper	1750	2000	87.5	80-120
Iron	22600	25000	90.4	80-120
Lead	1750	2000	87.5	80-120
Lithium				
Magnesium	anr			
Manganese	1760	2000	88.0	80-120
Molybdenum				
Nickel	1750	2000	87.5	80-120
Phosphorus				
Potassium	anr			
Selenium	1800	2000	90.0	80-120
Silicon				
Silver	212	250	84.8	80-120
Sodium	anr			
Strontium				
Sulfur				
Thallium	1830	2000	91.5	80-120
Tin				
Titanium				
Tungsten				
Vanadium	anr			

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/19/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc	1770	2000	88.5	80-120
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Zirconium

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.10.3

6

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	87.2	130	49.4 (a)	0-10
Arsenic	75300	74300	1.3	0-10
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	62.6	51.2	18.2 (a)	0-10
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	0.00	0.00	NC	0-10
Copper	4.00	5.60	40.0 (a)	0-10
Iron	54.4	98.0	80.1 (a)	0-10
Lead	0.00	0.00	NC	0-10
Lithium				
Magnesium	anr			
Manganese	86.5	87.6	17.3*(b)	0-10
Molybdenum				
Nickel	6.40	5.80	7.4	0-10
Phosphorus				
Potassium	anr			
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	10.3	5.20	173.7(a)	0-10
Sodium	anr			
Strontium				
Sulfur				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium	anr			

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 10/19/22

Metal	JD53458-39F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc 0.500 2.40 380.0(a) 0-10

Zirconium

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

(b) Serial dilution indicates possible matrix interference.

6.10.4

6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/19/22

Metal	Sample ml	Final ml	JD53458-39F Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Cerium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Phosphorus										
Potassium										
Selenium	19.25	20			1920	0.2	200	2000	96.0	80-120
Silicon										
Silver										
Sodium										
Strontium										
Sulfur										
Thallium										
Tin										
Titanium										
Tungsten										
Vanadium										

POST DIGESTATE SPIKE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35821  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/19/22

Metal	Sample ml	Final ml	JD53458-39F Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Zinc

Zirconium

Associated samples MP35821: JD53458-35F, JD53458-37F, JD53458-39F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(\*\*) Corr. sample result = Raw \* (sample volume / final volume)

(anr) Analyte not requested



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 10/21/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.7	8.1		
Antimony	2.0	.17	.41	0.030	<2.0
Arsenic	2.0	.21	.28	0.060	<2.0
Barium	20	.08	1.9		
Beryllium	0.20	.03	.08		
Bismuth	2.0	.23	.52		
Boron	10	.23	3.7		
Cadmium	0.50	.03	.07	0.010	<0.50
Calcium	500	.66	21		
Chromium	1.0	.03	.37		
Cobalt	5.0	.04	.28	0.020	<5.0
Copper	2.5	.08	.84	0.35	<2.5
Iron	50	.53	19	11.8	<50
Lead	2.0	.11	.41	0.28	<2.0
Lithium	5.0	.48	.92		
Magnesium	500	3.2	14		
Manganese	1.5	.01	.41	0.10	<1.5
Molybdenum	2.0	.06	.32		
Nickel	4.0	.04	.35	0.040	<4.0
Phosphorus	20	.12	3.3		
Potassium	1000	7.7	32		
Selenium	2.0	.32	.65	-0.020	<2.0
Silicon	20	.17	11		
Silver	0.50	.1	.17	0.19	<0.50
Sodium	1000	3.4	78		
Strontium	5.0	.03	.18		
Sulfur	10	.3	3.9		
Thallium	1.0	.18	.58	-0.060	<1.0
Tin	20	.08	3.8		
Titanium	1.0	.05	.34		
Tungsten	5.0	.26	1.8		
Vanadium	5.0	.06	.19		
Zinc	5.0	.01	2.3	0.55	<5.0

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 10/21/22

Metal	RL	IDL	MDL	MB raw	final
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Zirconium 2.0 .03 .54

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 10/21/22

Metal	JD53458-2 Original MS		Spikelot MPSPK2	% Rec	QC Limits
Aluminum					
Antimony	3.4	150	318	45.8N(a)	75-125
Arsenic	1380	1660	318	87.9	75-125
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium	1.1	296	318	92.6	75-125
Calcium					
Chromium					
Cobalt	11.2	306	318	92.7	75-125
Copper	69.1	351	318	89.2	75-125
Iron	21800	27500	3980	143.2(b)	75-125
Lead	592	754	318	54.0N(a)	75-125
Lithium					
Magnesium					
Manganese	539	866	318	102.7	75-125
Molybdenum					
Nickel	20.0	314	318	92.3	75-125
Phosphorus					
Potassium					
Selenium	8.8	288	318	87.7	75-125
Silicon					
Silver	0.51	36.9	39.8	88.9	75-125
Sodium					
Strontium					
Sulfur					
Thallium	1.1	316	318	98.9	75-125
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc	190	485	318	92.6	75-125

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 10/21/22

Metal	JD53458-2 Original MS	Spike lot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes

- (\*) Outside of QC limits
- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- (b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 10/21/22

Metal	JD53458-2 Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	3.4	152	315	46.9N(a)	1.3	20
Arsenic	1380	1550	315	53.9 (b)	6.9	20
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium	1.1	299	315	94.5	1.0	20
Calcium						
Chromium						
Cobalt	11.2	304	315	93.0	0.7	20
Copper	69.1	342	315	87.2	2.6	20
Iron	21800	26900	3940	129.4(b)	2.2	20
Lead	592	671	315	28.2N(a)	11.6	20
Lithium						
Magnesium						
Manganese	539	861	315	102.1	0.6	20
Molybdenum						
Nickel	20.0	311	315	92.3	1.0	20
Phosphorus						
Potassium						
Selenium	8.8	286	315	87.9	0.7	20
Silicon						
Silver	0.51	36.7	39.4	89.3	0.5	20
Sodium						
Strontium						
Sulfur						
Thallium	1.1	315	315	99.6	0.3	20
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	190	476	315	90.7	1.9	20

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 10/21/22

Metal	JD53458-2 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zirconium

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

(b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862

Methods: SW846 6010D

Matrix Type: SOLID

Units: mg/kg

Prep Date:

10/21/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony	189	200	94.5	80-120
Arsenic	185	200	92.5	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	187	200	93.5	80-120
Calcium				
Chromium				
Cobalt	190	200	95.0	80-120
Copper	187	200	93.5	80-120
Iron	2450	2500	98.0	80-120
Lead	187	200	93.5	80-120
Lithium				
Magnesium				
Manganese	188	200	94.0	80-120
Molybdenum				
Nickel	188	200	94.0	80-120
Phosphorus				
Potassium				
Selenium	187	200	93.5	80-120
Silicon				
Silver	23.0	25	92.0	80-120
Sodium				
Strontium				
Sulfur				
Thallium	202	200	101.0	80-120
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	186	200	93.0	80-120

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 10/21/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zirconium

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

6.11.3

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SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/21/22

Metal	JD53458-2 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	20.9	29.4	14.4 (a)	0-10
Arsenic	8430	8480	0.5	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium	6.50	6.70	3.1	0-10
Calcium				
Chromium				
Cobalt	68.3	66.4	0.2	0-10
Copper	421	413	1.3	0-10
Iron	133000	139000	4.6	0-10
Lead	3610	3600	1.5	0-10
Lithium				
Magnesium				
Manganese	3280	3440	4.8	0-10
Molybdenum				
Nickel	122	122	0.2	0-10
Phosphorus				
Potassium				
Selenium	53.5	52.9	1.1	0-10
Silicon				
Silver	3.10	16.9	85.7 (a)	0-10
Sodium				
Strontium				
Sulfur				
Thallium	6.50	0.00	100.0(a)	0-10
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	1160	1210	4.6	0-10

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 10/21/22

Metal	JD53458-2		QC	
	Original	SDL 1:5	%DIF	Limits

Zirconium

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

6.11.4  
6

POST DIGESTATE SPIKE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/21/22

Metal	Sample ml	Final ml	JD53458-2 Raw	PS Corr.** ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum									
Antimony	19.25	20	20.9	24.73625	1896	0.2	200	2000	93.6 80-120
Arsenic									
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver									
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									
Zinc									

POST DIGESTATE SPIKE SUMMARY

Login Number: JD53458  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP35862  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

10/21/22

Metal	Sample ml	Final ml	JD53458-2 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Zirconium

Associated samples MP35862: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC
- Percent Solids Raw Data Summary

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Phosphate, Ortho	GN34377	0.050	0.0	mg/l	0.2	0.19	95.0	90-110%
Sulfate	GP42917/GN34537	2.0	0.0	mg/l	80	82.0	102.5	90-110%
Sulfate	GP42918/GN34537	2.0	0.0	mg/l	80	82.7	103.4	90-110%

Associated Samples:  
Batch GN34377: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F  
Batch GP42917: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F  
Batch GP42918: JD53458-39F  
(\*) Outside of QC limits

7.1  
7

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Phosphate, Ortho	GN34377	JD53458-1F	mg/l	0.33	0.32	3.1	0-23%
Solids, Percent	GN34531	JD53458-2	%	62.8	58.1	7.8*(a)	0-5%
Sulfate	GP42917/GN34537	JD53701-1	mg/l	5.2	5.6	7.4	0-20%
Sulfate	GP42918/GN34537	JD53701-2	mg/l	0.92	0.92	0.0	0-20%

Associated Samples:

Batch GN34377: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F

Batch GN34531: JD53458-2, JD53458-4, JD53458-6, JD53458-8, JD53458-10, JD53458-12, JD53458-14, JD53458-16, JD53458-18, JD53458-20, JD53458-22, JD53458-24, JD53458-26, JD53458-28, JD53458-30, JD53458-32, JD53458-34, JD53458-36, JD53458-38, JD53458-40

Batch GP42917: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F

Batch GP42918: JD53458-39F

(\*) Outside of QC limits

(a) High RPD due to nature of sample matrix.

7.2  
7

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Phosphate, Ortho	GN34377	JD53458-1F	mg/l	0.33	0.2	0.50	85.0	25-150%
Sulfate	GP42917/GN34537	JD53701-1	mg/l	5.2	80	86.7	101.9	80-120%
Sulfate	GP42918/GN34537	JD53701-2	mg/l	0.92	80	81.7	101.0	80-120%

Associated Samples:

Batch GN34377: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F, JD53458-39F

Batch GP42917: JD53458-1F, JD53458-3F, JD53458-5F, JD53458-7F, JD53458-9F, JD53458-11F, JD53458-13F, JD53458-15F, JD53458-17F, JD53458-19F, JD53458-21F, JD53458-23F, JD53458-25F, JD53458-27F, JD53458-29F, JD53458-31F, JD53458-33F, JD53458-35F, JD53458-37F

Batch GP42918: JD53458-39F

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101801.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34537

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:32	GN34537-STD1	1		STDA
11:45	GN34537-STD2	1		STDC
11:58	GN34537-STD3	1		STDD
12:11	GN34537-STD4	1		STDE
12:24	GN34537-STD5	1		STDF
12:37	GN34537-STD6	1		STDG
12:50	GN34537-ICV1	1		
15:04	ZZZZZZ	1		
15:17	ZZZZZZ	1		
15:30	ZZZZZZ	1		
15:42	GN34537-CCV1	1		
15:55	GN34537-CCB1	1		
16:08	GP42917-MB1	1		
16:21	GP42917-B1	1		
16:34	GP42917-S1	1		
16:47	GP42917-D1	1		
17:00	JD53701-1	1		(sample used for QC only; not part of login JD53458)
17:13	JD53458-1F	1		
17:26	JD53458-3F	1		
17:39	JD53458-5F	1		
17:52	JD53458-7F	1		
18:05	JD53458-9F	1		
18:18	GN34537-CCV2	1		
18:30	GN34537-CCB2	1		
18:43	JD53458-11F	1		
18:56	JD53458-13F	1		
19:09	JD53458-15F	1		
19:22	JD53458-17F	1		
19:35	JD53458-19F	1		
19:48	JD53458-21F	1		
20:01	JD53458-23F	1		
20:14	JD53458-25F	1		
20:27	JD53458-27F	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101801.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34537

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:40	JD53458-29F	1		
20:53	GN34537-CCV3	1		
21:06	GN34537-CCB3	1		
21:18	JD53458-31F	1		
21:31	JD53458-33F	1		
21:44	JD53458-35F	1		
21:57	JD53458-37F	1		
22:10	GP42918-MB1	1		
22:23	GP42918-B1	1		
22:36	GP42918-S1	1		
22:49	GP42918-D1	1		
23:02	JD53701-2	1		(sample used for QC only; not part of login JD53458)
23:15	ZZZZZZ	1		
23:28	GN34537-CCV4	1		
23:41	GN34537-CCB4	1		
23:54	ZZZZZZ	1		
00:06	ZZZZZZ	1		
00:19	ZZZZZZ	1		
00:32	JD53458-39F	1		
00:45	GN34537-CCV5	1		
00:58	GN34537-CCB5	1		

Refer to raw data for calibration curve and standards.

7.4

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Instrument QC Summary  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101801.TXT

Date Analyzed: 10/13/22  
Run ID: GN34537

Methods: EPA 300/SW846 9056A  
Units: mg/l

Sample Number	Parameter	Result	RL	IDL/MDL	True Value	% Recov.	QC Limits
GN34537-ICV1	Sulfate	96.9	2.0	0.89	100	96.9	90-110
GN34537-CCV1	Sulfate	205	2.0	0.89	200	102.5	90-110
GN34537-CCB1	Sulfate	0.89 U	2.0	0.89			
GN34537-CCV2	Sulfate	205	2.0	0.89	200	102.5	90-110
GN34537-CCB2	Sulfate	0.89 U	2.0	0.89			
GN34537-CCV3	Sulfate	205	2.0	0.89	200	102.5	90-110
GN34537-CCB3	Sulfate	0.89 U	2.0	0.89			
GN34537-CCV4	Sulfate	206	2.0	0.89	200	103.0	90-110
GN34537-CCB4	Sulfate	0.89 U	2.0	0.89			
GN34537-CCV5	Sulfate	206	2.0	0.89	200	103.0	90-110
GN34537-CCB5	Sulfate	0.89 U	2.0	0.89			

(!) Outside of QC limits

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101901.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34602

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:32	GN34602-STD1	1		STDA
11:45	GN34602-STD2	1		STDC
11:58	GN34602-STD3	1		STDD
12:11	GN34602-STD4	1		STDE
12:24	GN34602-STD5	1		STDF
12:37	GN34602-STD6	1		STDG
12:50	GN34602-ICV1	1		
13:26	ZZZZZZ	1		
13:39	ZZZZZZ	1		
13:52	ZZZZZZ	1		
14:05	GN34602-CCV1	1		
14:18	GN34602-CCB1	1		
14:30	GP42957-MB1	1		
14:43	GP42957-B1	1		
14:56	GP42957-S1	1		
15:09	GP42957-D1	1		
15:22	LA83928-7	1		(sample used for QC only; not part of login JD53458)
15:35	ZZZZZZ	1		
15:48	ZZZZZZ	1		
16:01	ZZZZZZ	1		
16:14	ZZZZZZ	1		
16:27	ZZZZZZ	1		
16:40	GN34602-CCV2	1		
16:53	GN34602-CCB2	1		
17:06	ZZZZZZ	1		
17:18	ZZZZZZ	1		
17:31	ZZZZZZ	1		
17:44	ZZZZZZ	1		
17:57	ZZZZZZ	1		
18:12	ZZZZZZ	1		
18:25	JD53458-1F	4		
18:38	JD53458-3F	4		
18:51	JD53458-7F	2		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101901.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34602

Time	Sample Description	Dilution Factor	PS Recov	Comments
19:04	JD53458-9F	15		
19:17	GN34602-CCV3	1		
19:30	GN34602-CCB3	1		
19:42	JD53458-11F	15		
19:55	JD53458-13F	8		
20:08	JD53458-15F	7		
20:21	JD53458-17F	11		
20:34	JD53458-19F	12		
20:47	JD53458-21F	15		
21:00	JD53458-23F	16		
21:13	JD53458-25F	4		
21:26	JD53458-27F	11		
21:39	JD53458-33F	11		
21:52	GN34602-CCV4	1		
22:05	GN34602-CCB4	1		
22:18	JD53458-35F	11		
22:30	JD53458-37F	5		
22:43	JD53458-39F	4		
22:56	GP42958-MB1	1		
23:09	GP42958-B1	1		
23:22	GP42958-S1	1		
23:35	GP42958-D1	1		
23:48	JD53786-4	1		(sample used for QC only; not part of login JD53458)
00:01	ZZZZZZ	1		
00:14	ZZZZZZ	1		
00:27	GN34602-CCV5	1		
00:40	GN34602-CCB5	1		
00:53	ZZZZZZ	1		
01:05	ZZZZZZ	1		
01:18	GN34602-CCV6	1		
01:31	GN34602-CCB6	1		

Refer to raw data for calibration curve and standards.

Instrument QC Summary  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22101901.TXT

Date Analyzed: 10/13/22  
Run ID: GN34602

Methods: EPA 300/SW846 9056A  
Units: mg/l

Sample Number	Parameter	Result	RL	IDL/MDL	True Value	% Recov.	QC Limits
GN34602-ICV1	Sulfate	96.9	2.0	0.89	100	96.9	90-110
GN34602-CCV1	Sulfate	204	2.0	0.89	200	102.0	90-110
GN34602-CCB1	Sulfate	0.89 U	2.0	0.89			
GN34602-CCV2	Sulfate	204	2.0	0.89	200	102.0	90-110
GN34602-CCB2	Sulfate	0.89 U	2.0	0.89			
GN34602-CCV3	Sulfate	204	2.0	0.89	200	102.0	90-110
GN34602-CCB3	Sulfate	0.89 U	2.0	0.89			
GN34602-CCV4	Sulfate	206	2.0	0.89	200	103.0	90-110
GN34602-CCB4	Sulfate	0.89 U	2.0	0.89			

(!) Outside of QC limits

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22102001.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34660

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:32	GN34660-STD1	1		STDA
11:45	GN34660-STD2	1		STDC
11:58	GN34660-STD3	1		STDD
12:11	GN34660-STD4	1		STDE
12:24	GN34660-STD5	1		STDF
12:37	GN34660-STD6	1		STDG
12:50	GN34660-ICV1	1		
13:25	ZZZZZZ	1		
13:37	ZZZZZZ	1		
13:50	ZZZZZZ	1		
14:03	GN34660-CCV1	1		
16:31	GN34660-CCB1	1		
16:44	ZZZZZZ	4		
16:57	ZZZZZZ	5		
17:10	JD53458-35F	11		
17:23	JD53458-37F	5		
17:35	JD53458-39F	4		
17:49	GP42996-MB1	1		
18:02	GP42996-B1	1		
18:15	GP42996-S1	1		
18:28	GP42996-D1	1		
18:40	JD53786-4	1		(sample used for QC only; not part of login JD53458)
18:53	GN34660-CCV2	1		
19:06	GN34660-CCB2	1		
19:19	GP42989-MB1	1		
19:32	GP42989-B1	1		
19:45	GP42989-S1	1		
19:58	GP42989-D1	1		
20:11	LA84123-4	1		(sample used for QC only; not part of login JD53458)
20:24	ZZZZZZ	1		
20:37	ZZZZZZ	1		
20:50	ZZZZZZ	1		
21:04	ZZZZZZ	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22102001.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34660

Time	Sample Description	Dilution Factor	PS Recov	Comments
21:16	ZZZZZZ	1		
21:29	GN34660-CCV3	1		
21:42	GN34660-CCB3	1		
21:55	ZZZZZZ	1		
22:08	ZZZZZZ	1		
22:21	ZZZZZZ	1		
22:34	ZZZZZZ	1		
22:46	ZZZZZZ	1		
22:59	ZZZZZZ	1		
23:12	ZZZZZZ	1		
23:25	ZZZZZZ	1		
23:38	GP42990-MB1	1		
23:51	GP42990-B1	1		
00:04	GN34660-CCV4	1		
00:17	GN34660-CCB4	1		
00:30	GP42990-S1	1		
00:43	GP42990-D1	1		
00:56	LA84189-9	1		(sample used for QC only; not part of login JD53458)
01:09	ZZZZZZ	1		
01:22	ZZZZZZ	1		
01:34	ZZZZZZ	1		
01:47	ZZZZZZ	1		
02:00	ZZZZZZ	1		
02:13	ZZZZZZ	1		
02:26	ZZZZZZ	1		
02:39	GN34660-CCV5	1		
02:52	GN34660-CCB5	1		
03:05	ZZZZZZ	10		
03:18	ZZZZZZ	10		
03:31	ZZZZZZ	10		
03:44	ZZZZZZ	10		
03:57	GP42991-MB1	1		
04:09	GP42991-B1	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22102001.TXT  
Analyst: SS  
Parameters: Sulfate

Date Analyzed: 10/13/22      Methods: EPA 300/SW846 9056A  
Run ID: GN34660

Time	Sample Description	Dilution Factor	PS Recov	Comments
04:22	GP42991-S1	1		
04:35	GP42991-D1	1		
04:48	JD53991-1	1		(sample used for QC only; not part of login JD53458)
05:01	GN34660-CCV6	1		
05:14	GN34660-CCB6	1		
05:27	ZZZZZZ	1		
05:40	ZZZZZZ	1		
05:53	ZZZZZZ	1		
06:06	ZZZZZZ	1		
06:19	ZZZZZZ	1		
06:32	ZZZZZZ	1		
06:44	GN34660-CCV7	1		
06:57	GN34660-CCB7	1		

Refer to raw data for calibration curve and standards.

Instrument QC Summary  
Inorganics Analyses

Login Number: JD53458  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: F22102001.TXT

Date Analyzed: 10/13/22  
Run ID: GN34660

Methods: EPA 300/SW846 9056A  
Units: mg/l

Sample Number	Parameter	Result	RL	IDL/MDL	True Value	% Recov.	QC Limits
GN34660-ICV1	Sulfate	96.9	2.0	0.89	100	96.9	90-110
GN34660-CCV1	Sulfate	195	2.0	0.89	200	97.5	90-110
GN34660-CCB1	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV2	Sulfate	199	2.0	0.89	200	99.5	90-110
GN34660-CCB2	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV3	Sulfate	201	2.0	0.89	200	100.5	90-110
GN34660-CCB3	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV4	Sulfate	200	2.0	0.89	200	100.0	90-110
GN34660-CCB4	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV5	Sulfate	203	2.0	0.89	200	101.5	90-110
GN34660-CCB5	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV6	Sulfate	200	2.0	0.89	200	100.0	90-110
GN34660-CCB6	Sulfate	0.89 U	2.0	0.89			
GN34660-CCV7	Sulfate	201	2.0	0.89	200	100.5	90-110
GN34660-CCB7	Sulfate	0.00	2.0	0.89			

(!) Outside of QC limits

## Percent Solids Raw Data Summary

Page 1 of 4

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

---

**Sample:** JD53458-2      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-560 15-25' GW MW-560D SOIL C3 DAY 24

Wet Weight (Total)	31.46	g
Tare Weight	23.54	g
Dry Weight (Total)	28.51	g
Solids, Percent	62.8	%

---

**Sample:** JD53458-4      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-560 15-25' GW MW-560D SOIL C3 DUP DAY 24

Wet Weight (Total)	32.52	g
Tare Weight	26.13	g
Dry Weight (Total)	29.71	g
Solids, Percent	56	%

---

**Sample:** JD53458-6      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-560 15-25' GW MW-560D SOIL T3 DAY 24

Wet Weight (Total)	26.61	g
Tare Weight	21.21	g
Dry Weight (Total)	24.09	g
Solids, Percent	53.3	%

---

**Sample:** JD53458-8      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-560 15-25' GW MW-560D SOIL T3 DUP DAY 24

Wet Weight (Total)	34.53	g
Tare Weight	28.25	g
Dry Weight (Total)	31.45	g
Solids, Percent	51	%

---

**Sample:** JD53458-10      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-608D 10-15' GW MW-606S SOIL C3 DAY 24

Wet Weight (Total)	28.57	g
Tare Weight	19.79	g
Dry Weight (Total)	26.49	g
Solids, Percent	76.3	%

---

**Sample:** JD53458-12      **Analyzed:** 18-OCT-22 by BG      **Method:** SM2540 G 18TH ED MOD  
**ClientID:** SOIL MW-608D 10-15' GW MW-606S SOIL C3 DUP DAY 24

Wet Weight (Total)	34.58	g
Tare Weight	29.05	g
Dry Weight (Total)	33.01	g
Solids, Percent	71.6	%

---

## Percent Solids Raw Data Summary

Page 2 of 4

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

**Sample:** JD53458-14      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 10-15' GW MW-606S SOIL T3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	25.19	g
Tare Weight	18.96	g
Dry Weight (Total)	23.34	g
Solids, Percent	70.3	%

**Sample:** JD53458-16      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 10-15' GW MW-606S SOIL T3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	28.25	g
Tare Weight	22.87	g
Dry Weight (Total)	26.45	g
Solids, Percent	66.5	%

**Sample:** JD53458-18      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 25-33' GW MW-606D SOIL C3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	28.49	g
Tare Weight	21.03	g
Dry Weight (Total)	25.53	g
Solids, Percent	60.3	%

**Sample:** JD53458-20      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 25-33' GW MW-606D SOIL C3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	35.72	g
Tare Weight	28.84	g
Dry Weight (Total)	33.2	g
Solids, Percent	63.4	%

**Sample:** JD53458-22      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 25-33' GW MW-606D SOIL T3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	28.01	g
Tare Weight	21.66	g
Dry Weight (Total)	25.37	g
Solids, Percent	58.4	%

**Sample:** JD53458-24      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-608D 25-33' GW MW-606D SOIL T3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	31.13	g
Tare Weight	25.57	g
Dry Weight (Total)	28.94	g
Solids, Percent	60.6	%

## Percent Solids Raw Data Summary

Page 3 of 4

**Job Number:** JD53458  
**Account:** SUNOCOSS Sunoco/Evergreen  
**Project:** SANHPAFW: Marcus Hook, PA

**Sample:** JD53458-26      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	24.56	g
Tare Weight	19.14	g
Dry Weight (Total)	22.22	g
Solids, Percent	56.8	%

**Sample:** JD53458-28      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL AO17 BH22 20-28' GW MW-56D SOIL C3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	30.49	g
Tare Weight	24.14	g
Dry Weight (Total)	28.13	g
Solids, Percent	62.8	%

**Sample:** JD53458-30      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	32.9	g
Tare Weight	24.86	g
Dry Weight (Total)	30.32	g
Solids, Percent	67.9	%

**Sample:** JD53458-32      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL AO17 BH22 20-28' GW MW-56D SOIL T3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	28.6	g
Tare Weight	20.31	g
Dry Weight (Total)	25.16	g
Solids, Percent	58.5	%

**Sample:** JD53458-34      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-609D 18-23' GW MW-609D SOIL C3 DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	31.78	g
Tare Weight	26.57	g
Dry Weight (Total)	29.53	g
Solids, Percent	56.8	%

**Sample:** JD53458-36      **Analyzed:** 18-OCT-22 by BG  
**ClientID:** SOIL MW-609D 18-23' GW MW-609D SOIL C3 DUP DAY 24

**Method:** SM2540 G 18TH ED MOD

Wet Weight (Total)	30.13	g
Tare Weight	24.13	g
Dry Weight (Total)	27.84	g
Solids, Percent	61.8	%

Percent Solids Raw Data Summary

Job Number: JD53458  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD53458-38 Analyzed: 18-OCT-22 by BG Method: SM2540 G 18TH ED MOD  
ClientID: SOIL MW-609D 18-23' GW MW-609D SOIL T3 DAY 24

Wet Weight (Total)	33.3	g
Tare Weight	24.53	g
Dry Weight (Total)	30.14	g
Solids, Percent	64	%

Sample: JD53458-40 Analyzed: 18-OCT-22 by BG Method: SM2540 G 18TH ED MOD  
ClientID: SOIL MW-609D 18-23' GW MW-609D SOIL T3 DUP DAY 24

Wet Weight (Total)	26.62	g
Tare Weight	21.02	g
Dry Weight (Total)	24.59	g
Solids, Percent	63.8	%



Setting the Standards for Innovative Environmental Solutions

**QUALITY ASSURANCE REVIEW  
OF THE SOIL SAMPLES AND AQUEOUS BLANK  
COLLECTED ON APRIL 4, 5, AND 6, 2022, AND MAY 11, 2022  
AT THE MARCUS HOOK INDUSTRIAL COMPLEX SITE  
IN MARCUS HOOK, PENNSYLVANIA**

June 14, 2022

Prepared for:

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## 1.0 Introduction

This quality assurance (QA) review is based upon a rigorous examination of all data generated from the analyses of the soil samples (including quality control [QC] samples and one aqueous blank) that were collected by Sanborn, Head & Associates, Inc. (Sanborn Head), on April 4, 5, and 6, 2022, and May 11, 2022, at the Marcus Hook Industrial Complex Site in Marcus Hook, Pennsylvania. The samples included in this QA review are specified on Table 1.

This review has been performed with guidance from the “National Functional Guidelines for Inorganic Data Review” (US EPA, February 1994). This document specifically addresses analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods. These validation guidelines are, therefore, not completely applicable to the type of analyses and analytical protocol performed for these samples. This document has been used to aid the data reviewer in the interpretation of the QC analysis results and in the overall evaluation of the sample data deliverables. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the requirements in the analytical methods utilized by the laboratory.

Details of this QA review are presented in Section 2 of this report. The reported analytical results are presented as a summary of the data in Section 7. Data were examined to determine the usability of the analytical results and the compliance relative to the requirements specified in the published analytical method. Qualifier codes have been placed next to results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. This critical QA review identifies data quality issues for specific samples and specific evaluation criteria. The data qualifications allow the data's end-user to best understand the usability of the analytical results. Data not qualified in this report should be considered valid based on the QC criteria that have been reviewed. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories.

**TABLE 1****SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW**

Field Sample Identification	Laboratory Sample Identification	Laboratory Login Number	Matrix	Date Sample Collected	Parameters Examined
MW-608D_0-5_20220404	JD42497-1	JD42497	Soil	4/4/22	As, Fe
MW-609D_0-5_20220404	JD42497-2	JD42497	Soil	4/4/22	As, Fe
MW-609D_5-10_20220405	JD42497-3	JD42497	Soil	4/5/22	As, Fe
MW-609D_10-15_20220405	JD42497-4	JD42497	Soil	4/5/22	As, Fe
MW-609D_15-20_20220405	JD42497-5	JD42497	Soil	4/5/22	As, Fe
MW-609D_20-25_20220405	JD42497-6	JD42497	Soil	4/5/22	As, Fe
MW-609D_20-25_20220405MS (Matrix Spike)	JD42497-6MS	JD42497	Soil	4/5/22	As, Fe
MW-609D_20-25_20220405MSD (Matrix Spike Duplicate)	JD42497-6MSD	JD42497	Soil	4/5/22	As, Fe
MW-609D_25-30_20220405	JD42497-7	JD42497	Soil	4/5/22	As, Fe
MW-609D_30-35_20220405	JD42497-8	JD42497	Soil	4/5/22	As, Fe
AOI7-BH-22-001_0-5_20220404	JD42497-9	JD42497	Soil	4/4/22	As, Fe
AOI7-BH-22-001_5-10_20220404	JD42497-10	JD42497	Soil	4/4/22	As, Fe
AOI7-BH-22-001_10-15_20220404	JD42497-11	JD42497	Soil	4/4/22	As, Fe
AOI7-BH-22-001_15-20_20220404	JD42497-12	JD42497	Soil	4/4/22	As, Fe
AOI7-BH-22-001_20-25_20220404	JD42497-13	JD42497	Soil	4/4/22	As, Fe
AOI7-BH-22-001_25-30_20220404	JD42497-14	JD42497	Soil	4/4/22	As, Fe
MW-609D_35-40_20220405	JD42497-15	JD42497	Soil	4/5/22	As, Fe
MW-608D_5-10_20220406	JD42497-22	JD42497	Soil	4/6/22	As, Fe
MW-608D_10-15_20220406	JD42497-23	JD42497	Soil	4/6/22	As, Fe
MW-608D_15-20_20220406	JD42497-24	JD42497	Soil	4/6/22	As, Fe
MW-608D_15-20_20220406MS (Matrix Spike)	JD42497-24MS	JD42497	Soil	4/6/22	As, Fe
MW-608D_15-20_20220406MSD (Matrix Spike Duplicate)	JD42497-24MSD	JD42497	Soil	4/6/22	As, Fe
MW-608D_20-25_20220406	JD42497-25	JD42497	Soil	4/6/22	As, Fe
MW-608D_25-30_20220406	JD42497-26	JD42497	Soil	4/6/22	As, Fe
MW-608D_30-35_20220406	JD42497-27	JD42497	Soil	4/6/22	As, Fe

**TABLE 1 (Cont.)**

Field Sample Identification	Laboratory Sample Identification	Laboratory Login Number	Matrix	Date Sample Collected	Parameters Examined
EB-01_20220406 (Equipment Blank)	JD42497-28	JD42497	Aq	4/6/22	As, Fe
MW-608D_15-20_FD_20220406 (Field Duplicate of MW-608D_15-20_20220406)	JD42497-29	JD42497	Soil	4/6/22	As, Fe
MW-608D_35-40_20220406	JD42497-30	JD42497	Soil	4/6/22	As, Fe
MW-559D_0-5_20220511	JD44648-1	JD44648	Soil	5/11/22	As, Fe
MW-559D_5-10_20220511	JD44648-2	JD44648	Soil	5/11/22	As, Fe
MW-559D_10-15_20220511	JD44648-3	JD44648	Soil	5/11/22	As, Fe
MW-559D_15-20_20220511	JD44648-4	JD44648	Soil	5/11/22	As, Fe
MW-559D_20-25_20220511	JD44648-5	JD44648	Soil	5/11/22	As, Fe
MW-559D_25-30_20220511	JD44648-6	JD44648	Soil	5/11/22	As, Fe
MW-560D_0-5_20220511	JD44648-7	JD44648	Soil	5/11/22	As, Fe
MW-560D_0-5_20220511MS (Matrix Spike)	JD44648-7MS	JD44648	Soil	5/11/22	As, Fe
MW-560D_0-5_20220511MSD (Matrix Spike Duplicate)	JD44648-7MSD	JD44648	Soil	5/11/22	As, Fe
MW-560D_5-10_20220511	JD44648-8	JD44648	Soil	5/11/22	As, Fe
MW-560D_10-15_20220511	JD44648-9	JD44648	Soil	5/11/22	As, Fe
MW-560D_15-20_20220511	JD44648-10	JD44648	Soil	5/11/22	As, Fe
MW-560D_20-25_20220511	JD44648-11	JD44648	Soil	5/11/22	As, Fe
MW-560D_25-30_20220511	JD44648-12	JD44648	Soil	5/11/22	As, Fe

**NOTES:**

As - Total Arsenic by SW-846 Method 6010D. (42 samples)  
Fe - Total Iron by SW-846 Method 6010D. (42 samples)  
Aq - Aqueous.

## 2.0 Findings

Complete support documentation for this inorganic QA review is presented in Section 8.0 of this report.

Forty-two samples (including QC samples) were analyzed for total inductively coupled plasma (ICP) metals (specifically, arsenic and iron) by SW-846 Method 6010D by SGS North America, Inc. of Dayton, New Jersey, and reported in Sample Delivery Groups (SDGs) JD42497 and JD44648. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	√		
Sample Condition Upon Receipt	√		
Blank Analysis Results	√		
MS/MSD Results		√	
LCS Results	√		
Field Duplicate Precision	√		
Serial Dilution Results		√	
Percent Solids Results	√		
Detection Limits/Sensitivity	√		
Calibrations	√		
Continuing Calibrations	√		
RL Standard Recoveries	√		
ICP Interference Check Samples	√		
Linear Range Check Results	√		
Analytical Sequence	√		
Sample Preparation	√		
Sample Login	√		

**MS/MSD Results:** The reported positive results for total arsenic in all SDG JD44648 samples should be considered estimated and have been flagged “J+” (unless otherwise flagged “J”) on the data tables. A high recovery (> 125%) was observed for total arsenic in the associated matrix spike (MS) analysis. (Reason Code: MS)

The reported positive results for total arsenic in all SDG JD44648 samples should be considered estimated and have been flagged “J” on the data tables. A high relative percent difference (RPD > 20%) was observed between the results for total arsenic in the associated MS/matrix spike duplicate (MSD) analyses. (Reason Code: MS/SD)

**Serial Dilution Results:** The reported positive results for total iron in SDG JD42497 samples MW-608D\_0-5\_20220404, MW-609D\_0-5\_20220404, MW-609D\_5-10\_20220405, MW-609D\_10-15\_20220405, MW-609D\_15-20\_20220405, MW-609D\_20-25\_20220405, MW-609D\_25-30\_20220405, MW-609D\_30-35\_20220405, AOI7-BH-22-001\_0-5\_20220404, AOI7-BH-22-001\_5-10\_20220404, AOI7-BH-22-001\_10-15\_20220404, AOI7-BH-22-001\_15-20\_20220404, AOI7-BH-22-001\_20-25\_20220404, AOI7-BH-22-001\_25-30\_20220404, and MW-609D\_35-40\_20220405 should be considered estimated and have been flagged “J” on the data tables. A high percent difference (%D > 10% when the original result was > 5× the detection limit) was observed for total iron in the serial dilution analysis. (Reason Code: DL)

### 3.0 Qualifier Summary

Analyte	Login Number	Samples	Validation Qualifier	Reason for Qualification
total arsenic	JD44648	All samples	J+ (unless otherwise flagged “J”)	MS – High MS recovery
total arsenic	JD44648	All samples	J	MS/SD – MS/MSD imprecision
total iron	JD42497	MW-608D_0-5_20220404, MW-609D_0-5_20220404, MW-609D_5-10_20220405, MW-609D_10-15_20220405, MW-609D_15-20_20220405, MW-609D_20-25_20220405, MW-609D_25-30_20220405, MW-609D_30-35_20220405, AOI7-BH-22-001_0-5_20220404, AOI7-BH-22-001_5-10_20220404, AOI7-BH-22-001_10-15_20220404, AOI7-BH-22-001_15-20_20220404, AOI7-BH-22-001_20-25_20220404, AOI7-BH-22-001_25-30_20220404, and MW-609D_35-40_20220405	J	DL – Serial dilution imprecision

### 4.0 Overall Assessment

Based on this QA review, the results for total arsenic in several samples were qualified as estimated due to a high MS recovery and MS/MSD imprecision. The results for total iron in several samples were qualified as estimated due to serial dilution imprecision. In addition, with the exception of SDG JD42497 sample AOI7-BH-22-001\_0-5\_20220404, the results for total arsenic in all soil samples were above the action limit of 3 mg/kg. A “not-detected” result was reported for total arsenic in SDG JD42497 sample AOI7-BH-22-001\_0-5\_20220404 with a reporting limit of 4.4 mg/kg.

## 5.0 Inorganic Data Qualifiers and Reason Codes

### Inorganic Data Qualifiers

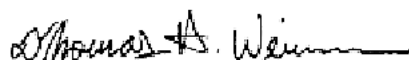
- U The analyte was not detected above the associated reporting limit.
- UB The analyte should be considered “not-detected” because it was observed in an associated laboratory or field blank at a similar level. The analyte was positively identified; the associated numerical value represents the concentration reported by the laboratory but may be impacted by contamination.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J- The result is an estimated quantity and should be considered biased low.
- J+ The result is an estimated quantity and should be considered biased high.
- UJ The analyte was not detected above the reported sample quantitation limit; however, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The analyte was reported as detected, but sample results are unreliable due to serious analytical deficiencies. The presence or absence of the analyte cannot be verified.
- UR The analyte was reported as not detected, but the determination that the analyte was not present in the sample is unreliable due to serious analytical deficiencies. The presence or absence of the analyte cannot be verified.

Reason Code <sup>1</sup>	Description
H	Bias in sample result likely to be high
L	Bias in sample result likely to be low
I	Bias in sample result is indeterminate
EC	Result exceeds the calibration range.
HT	Holding time requirement was not met
MB	Method blank or preparation blank contamination
LCS	Laboratory control sample evaluation criteria not met
FB	Field blank contamination
RB	Rinsate blank contamination
SQL	The analysis meets all qualitative identification criteria, but the measured concentration is less than the reporting limit.
FD	Field duplicate evaluation criteria not met
TvP	Total to Partial criteria not met
RL	Reporting limit exceeds decision criteria (for non-detects)
ICV	Initial calibration verification evaluation criteria not met
CCV	Continuing calibration verification evaluation criteria not met
CCB	Continuing calibration blank contamination
PB	Preparation Blank
ICS	Interference check sample evaluation criteria not met
D	Laboratory duplicate or spike duplicate precision evaluation criteria not met

Reason Code <sup>1</sup>	Description
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correction coefficient $\geq 0.995$
DL	Serial dilution results did not meet evaluation criteria
TUNE	Instrument performance (tuning) criteria not met
ICAL	Initial calibration evaluation criteria not met
CCAL	Continuing calibration evaluation criteria not met
SUR	Surrogate recovery outside acceptance range
MS/SD	Matrix spike/matrix spike duplicate precision criteria not met
IS	Internal standard evaluation criteria not met
LM	The PFK lock mass SICPs indicate that ion suppression evident
ID	Target compound identification criteria not met
NSR	Not selected for reporting because the result was qualified as unusable
NSDL	Not selected for reporting because diluted result was selected for reporting
NSQ	Not selected for reporting because result was lesser quality based on data validation.
NSO	Not selected for reporting because of other reason

## 6.0 Signatures

Report Prepared by,



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Date: 6/14/22



## **7.0 ANALYTICAL RESULTS**

**A.     SDG JD42497**

**Analytical Results**  
**SDG JD42497**

Laboratory Sample ID	Field Sample ID	Sample Date	Matrix	Method	Cas #	Analyte	Result	QL	Unit	Validator Qualifier	Reason Code	DF
JD42497-1	MW-608D_0-5_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	76.4		%			1
JD42497-1	MW-608D_0-5_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	34800	130	mg/kg	J	DL	2
JD42497-1	MW-608D_0-5_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	85.2	5.2	mg/kg			2
JD42497-10	AOI7-BH-22-001_5-10_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	75.2		%			1
JD42497-10	AOI7-BH-22-001_5-10_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	17700	65	mg/kg	J	DL	1
JD42497-10	AOI7-BH-22-001_5-10_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	9.2	2.6	mg/kg			1
JD42497-11	AOI7-BH-22-001_10-15_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	59.8		%			1
JD42497-11	AOI7-BH-22-001_10-15_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	12400	84	mg/kg	J	DL	1
JD42497-11	AOI7-BH-22-001_10-15_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	6.9	3.4	mg/kg			1
JD42497-12	AOI7-BH-22-001_15-20_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	73.4		%			1
JD42497-12	AOI7-BH-22-001_15-20_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	27900	130	mg/kg	J	DL	2
JD42497-12	AOI7-BH-22-001_15-20_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	12.6	5.3	mg/kg			2
JD42497-13	AOI7-BH-22-001_20-25_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	64.9		%			1
JD42497-13	AOI7-BH-22-001_20-25_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	8270	30	mg/kg			10
JD42497-13	AOI7-BH-22-001_20-25_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	23600	74	mg/kg	J	DL	1
JD42497-14	AOI7-BH-22-001_25-30_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	56.4		%			1
JD42497-14	AOI7-BH-22-001_25-30_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	32200	84	mg/kg	J	DL	1
JD42497-14	AOI7-BH-22-001_25-30_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	1310	3.4	mg/kg			1
JD42497-15	MW-609D_35-40_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	65.5		%			1
JD42497-15	MW-609D_35-40_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	26600	80	mg/kg	J	DL	1
JD42497-15	MW-609D_35-40_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	1330	6.4	mg/kg			2
JD42497-2	MW-609D_0-5_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	77.5		%			1
JD42497-2	MW-609D_0-5_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	34600	130	mg/kg	J	DL	2
JD42497-2	MW-609D_0-5_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	153	5.1	mg/kg			2
JD42497-22	MW-608D_5-10_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	78.5		%			1
JD42497-22	MW-608D_5-10_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	23700	61	mg/kg			1
JD42497-22	MW-608D_5-10_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	38.3	2.4	mg/kg			1
JD42497-23	MW-608D_10-15_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	80.1		%			1
JD42497-23	MW-608D_10-15_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	24600	62	mg/kg			1
JD42497-23	MW-608D_10-15_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	33.4	2.5	mg/kg			1
JD42497-24	MW-608D_15-20_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	84.2		%			1
JD42497-24	MW-608D_15-20_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	37200	300	mg/kg			5
JD42497-24	MW-608D_15-20_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	21.1	12	mg/kg			5
JD42497-25	MW-608D_20-25_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	87.3		%			1
JD42497-25	MW-608D_20-25_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	21000	57	mg/kg			1
JD42497-25	MW-608D_20-25_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	10.7	2.3	mg/kg			1
JD42497-26	MW-608D_25-30_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	80.3		%			1
JD42497-26	MW-608D_25-30_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	28000	120	mg/kg			2
JD42497-26	MW-608D_25-30_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	112	4.9	mg/kg			2
JD42497-27	MW-608D_30-35_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	66.2		%			1
JD42497-27	MW-608D_30-35_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	18800	73	mg/kg			1
JD42497-27	MW-608D_30-35_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	14800	58	mg/kg			20
JD42497-28	EB-01_20220406	06-Apr-22	WQ	SW6010D	7439-89-6	IRON		100	ug/L	U		1
JD42497-28	EB-01_20220406	06-Apr-22	WQ	SW6010D	7440-38-2	ARSENIC		3.0	ug/L	U		1

Analytical Results  
SDG JD42497

Laboratory Sample ID	Field Sample ID	Sample Date	Matrix	Method	Cas #	Analyte	Result	QL	Unit	Validator Qualifier	Reason Code	DF
JD42497-29	MW-608D_15-20_FD_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	86.0		%			1
JD42497-29	MW-608D_15-20_FD_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	43800	280	mg/kg			5
JD42497-29	MW-608D_15-20_FD_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	27.3	11	mg/kg			5
JD42497-3	MW-609D_5-10_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	65.2		%			1
JD42497-3	MW-609D_5-10_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	16800	77	mg/kg	J	DL	1
JD42497-3	MW-609D_5-10_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	9.3	3.1	mg/kg			1
JD42497-30	MW-608D_35-40_20220406	06-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	68.8		%			1
JD42497-30	MW-608D_35-40_20220406	06-Apr-22	SO	SW6010D	7439-89-6	IRON	24100	74	mg/kg			1
JD42497-30	MW-608D_35-40_20220406	06-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	10900	30	mg/kg			10
JD42497-4	MW-609D_10-15_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	69.3		%			1
JD42497-4	MW-609D_10-15_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	30300	140	mg/kg	J	DL	2
JD42497-4	MW-609D_10-15_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	13.8	5.6	mg/kg			2
JD42497-5	MW-609D_15-20_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	82.3		%			1
JD42497-5	MW-609D_15-20_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	74700	300	mg/kg	J	DL	5
JD42497-5	MW-609D_15-20_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	409	12	mg/kg			5
JD42497-6	MW-609D_20-25_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	89.3		%			1
JD42497-6	MW-609D_20-25_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	16200	57	mg/kg	J	DL	1
JD42497-6	MW-609D_20-25_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	5.8	2.3	mg/kg			1
JD42497-7	MW-609D_25-30_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	67.8		%			1
JD42497-7	MW-609D_25-30_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	144000	380	mg/kg	J	DL	5
JD42497-7	MW-609D_25-30_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	399	15	mg/kg			5
JD42497-8	MW-609D_30-35_20220405	05-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	66.4		%			1
JD42497-8	MW-609D_30-35_20220405	05-Apr-22	SO	SW6010D	7440-38-2	ARSENIC	10400	31	mg/kg			10
JD42497-8	MW-609D_30-35_20220405	05-Apr-22	SO	SW6010D	7439-89-6	IRON	24400	78	mg/kg	J	DL	1
JD42497-9	AOI7-BH-22-001_0-5_20220404	04-Apr-22	SO	SM2540D	SOLID	SOLIDS, PERCENT	87.1		%			1
JD42497-9	AOI7-BH-22-001_0-5_20220404	04-Apr-22	SO	SW6010D	7439-89-6	IRON	32300	110	mg/kg	J	DL	2
JD42497-9	AOI7-BH-22-001_0-5_20220404	04-Apr-22	SO	SW6010D	7440-38-2	ARSENIC		4.4	mg/kg			2

**B.     SDG JD44648**

Analytical Results  
SDG JD44648

Laboratory Sample ID	Field Sample ID	Sample Date	Matrix	Method	Cas #	Analyte	Result	QL	Unit	Validator Qualifier	Reason Code	Reason Code	DF
JD44648-1	MW-559D_0-5_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	86.9		%				1
JD44648-1	MW-559D_0-5_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	100000	580	mg/kg				10
JD44648-1	MW-559D_0-5_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	473	23	mg/kg	J	MS	MS/SD	10
JD44648-10	MW-560D_15-20_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	62.1		%				1
JD44648-10	MW-560D_15-20_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	30500	84	mg/kg				1
JD44648-10	MW-560D_15-20_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	10800	34	mg/kg	J	MS	MS/SD	10
JD44648-11	MW-560D_20-25_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	64.9		%				1
JD44648-11	MW-560D_20-25_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	37900	160	mg/kg				2
JD44648-11	MW-560D_20-25_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	488	6.3	mg/kg	J	MS	MS/SD	2
JD44648-12	MW-560D_25-30_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	80.6		%				1
JD44648-12	MW-560D_25-30_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	16900	61	mg/kg				1
JD44648-12	MW-560D_25-30_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	105	2.5	mg/kg	J	MS	MS/SD	1
JD44648-2	MW-559D_5-10_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	80.9		%				1
JD44648-2	MW-559D_5-10_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	192000	620	mg/kg				10
JD44648-2	MW-559D_5-10_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	422	25	mg/kg	J	MS	MS/SD	10
JD44648-3	MW-559D_10-15_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	60.5		%				1
JD44648-3	MW-559D_10-15_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	50500	160	mg/kg				2
JD44648-3	MW-559D_10-15_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	9890	32	mg/kg	J	MS	MS/SD	10
JD44648-4	MW-559D_15-20_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	83.5		%				1
JD44648-4	MW-559D_15-20_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	158000	590	mg/kg				10
JD44648-4	MW-559D_15-20_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	719	23	mg/kg	J	MS	MS/SD	10
JD44648-5	MW-559D_20-25_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	64.8		%				1
JD44648-5	MW-559D_20-25_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	37700	160	mg/kg				2
JD44648-5	MW-559D_20-25_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	1770	6.3	mg/kg	J	MS	MS/SD	2
JD44648-6	MW-559D_25-30_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	87.6		%				1
JD44648-6	MW-559D_25-30_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	31300	120	mg/kg				2
JD44648-6	MW-559D_25-30_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	12.2	4.7	mg/kg	J	MS	MS/SD	2
JD44648-7	MW-560D_0-5_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	76.4		%				1
JD44648-7	MW-560D_0-5_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	47000	330	mg/kg				5
JD44648-7	MW-560D_0-5_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	239	13	mg/kg	J	MS	MS/SD	5
JD44648-8	MW-560D_5-10_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	71.7		%				1
JD44648-8	MW-560D_5-10_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	101000	360	mg/kg				5
JD44648-8	MW-560D_5-10_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	2890	15	mg/kg	J	MS	MS/SD	5
JD44648-9	MW-560D_10-15_20220511	11-May-22	SO	SM2540E	SOLID	SOLIDS, PERCENT	67.0		%				1
JD44648-9	MW-560D_10-15_20220511	11-May-22	SO	SW6010D	7439-89-6	IRON	16300	75	mg/kg				1
JD44648-9	MW-560D_10-15_20220511	11-May-22	SO	SW6010D	7440-38-2	ARSENIC	6940	30	mg/kg	J	MS	MS/SD	10

## **8.0 SUPPORTING DOCUMENTATION**

**A.     SDG JD42497**





## Sample Summary

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD42497-1	04/04/22	13:20 LRT	04/05/22	SO	Soil	MW-608D_0-5_20220404 ✓
JD42497-2	04/04/22	13:15 LRT	04/05/22	SO	Soil	MW-609D_0-5_20220404 ✓
JD42497-3	04/05/22	11:00 LRT	04/05/22	SO	Soil	MW-609D_5-10_20220405 ✓
JD42497-4	04/05/22	11:10 LRT	04/05/22	SO	Soil	MW-609D_10-15_20220405 ✓
JD42497-5	04/05/22	11:20 LRT	04/05/22	SO	Soil	MW-609D_15-20_20220405 ✓
JD42497-6	04/05/22	11:25 LRT	04/05/22	SO	Soil	MW-609D_20-25_20220405 ✓
JD42497-7	04/05/22	11:30 LRT	04/05/22	SO	Soil	MW-609D_25-30_20220405 ✓
JD42497-8	04/05/22	11:35 LRT	04/05/22	SO	Soil	MW-609D_30-35_20220405 ✓
JD42497-9	04/04/22	14:25 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_0-5_20220404 ✓
JD42497-10	04/04/22	14:50 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_5-10_20220404 ✓
JD42497-11	04/04/22	15:05 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_10-15_20220404 ✓
JD42497-12	04/04/22	15:00 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_15-20_20220404 ✓
JD42497-13	04/04/22	15:10 LRT	04/05/22	SO	Soil	AOI7-BH-22-001_20-25_20220404 ✓

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD42497

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type		Client Sample ID
JD42497-14	04/04/22	15:20 LRT	04/05/22	SO	Soil	✓	AOI7-BH-22-001_25-30_20220404
JD42497-15	04/05/22	11:40 LRT	04/05/22	SO	Soil	✓	MW-609D_35-40_20220405
JD42497-22	04/06/22	08:40 LRT	04/06/22	SO	Soil	✓	MW-608D_5-10_20220406
JD42497-23	04/06/22	08:45 LRT	04/06/22	SO	Soil	✓	MW-608D_10-15_20220406
JD42497-24	04/06/22	08:50 LRT	04/06/22	SO	Soil	✓	MW-608D_15-20_20220406
JD42497-24D	04/06/22	09:00 LRT	04/06/22	SO	Soil Dup/MSD	✓	MW-608D_15-20_MSD_20220406
JD42497-24S	04/06/22	09:00 LRT	04/06/22	SO	Soil Matrix Spike	✓	MW-608D_15-20_MS_20220406
JD42497-25	04/06/22	08:55 LRT	04/06/22	SO	Soil	✓	MW-608D_20-25_20220406
JD42497-26	04/06/22	09:00 LRT	04/06/22	SO	Soil	✓	MW-608D_25-30_20220406
JD42497-27	04/06/22	09:05 LRT	04/06/22	SO	Soil	✓	MW-608D_30-35_20220406
JD42497-28	04/06/22	13:00 LRT	04/06/22	AQ	Equipment Blank	✓	EB-01_20220406
JD42497-29	04/06/22	09:00 LRT	04/06/22	SO	Soil	✓	MW-608D_15-20_FD_20220406
JD42497-30	04/06/22	09:10 LRT	04/06/22	SO	Soil	✓	MW-608D_35-40_20220406

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

2

**Client:** Sunoco/Evergreen

**Job No:** JD42497

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 4/15/2022 11:56:29 A

Between 04/05/2022 and 04/06/2022, 24 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD42497 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP32253

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42841-1MS, JD42841-1MSD, JD42841-1SDL were used as the QC samples for metals.

**Matrix:** SO

**Batch ID:** MP32168

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42497-6MS, JD42497-6MSD, JD42497-6SDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for Serial Dilution for Iron are outside control limits. Serial dilution indicates possible matrix interference.
- JD42497-7 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-1 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-9 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-5 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-4 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-12 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-2 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

**Matrix:** SO

**Batch ID:** MP32224

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD42497-24MS, JD42497-24MSD, JD42497-24PS, JD42497-24SDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MS/MSD for Iron are outside control limits. High rpd due to possible sample nonhomogeneity.
- JD42497-29 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-24 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD42497-26 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

**Matrix:** SO

**Batch ID:** MP32248

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Friday, April 15, 2022

Page 1 of 2

## Metals Analysis By Method SW846 6010D

<b>Matrix:</b> SO	<b>Batch ID:</b> MP32248
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- Sample(s) JD42748-1MS, JD42748-1MSD, JD42748-1SDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MS/MSD for Iron are outside control limits. High rpd due to possible sample nonhomogeneity.
- RPD(s) for Serial Dilution for Arsenic are outside control limits. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

## General Chemistry By Method SM2540 G 18TH ED MOD

<b>Matrix:</b> SO	<b>Batch ID:</b> GN27930
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- Sample(s) JD42497-2DUP were used as the QC samples for Solids, Percent.

<b>Matrix:</b> SO	<b>Batch ID:</b> GN28061
-------------------	--------------------------

- Sample(s) JD42497-24DUP were used as the QC samples for Solids, Percent.

<b>Matrix:</b> SO	<b>Batch ID:</b> GN28088
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- Sample(s) JD42804-1DUP were used as the QC samples for Solids, Percent.

<b>Matrix:</b> SO	<b>Batch ID:</b> GN28092
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- Sample(s) JD42778-5DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

SO

JD42497

**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton--  
 2235 Route 130, Dayton, NJ 08810  
 TEL 732-329-0200 FAX 732-329-3499

Page 1 of 4  
 Please merge with SDG  
 1P-032222-361

Company Name  
**Sanborn Head & Associates**  
 Street Address  
 1015 Virginia Dr, Suite 100  
 City State Zip  
 Fort Washington, PA, 19034  
 Project Contact  
 Shana Whitney  
 shawwhitney@sanbornhead.com  
 Phone #  
 603-415-6159  
 Sample(s) Name(s)  
 Evergreen Marcus Hook

Project Name  
**Evergreen Marcus Hook**  
 Street  
 100 Green Street  
 City  
 Marcus Hook, PA 19061  
 Project #  
 4862.04  
 Client Purchase Order #  
 Project Manager  
 Chelsey Shepsko  
 Billing Information (if different from Report to)  
 Company Name  
 Sanborn Head & Associates  
 Street Address  
 20 Foundry Street  
 City State Zip  
 Concord, NH, 03301  
 Account Number  
 Chelsey Shepsko is the primary contact for all correspondence.

Matrix Codes  
 DW - Drinking Water  
 GW - Groundwater  
 WW - Wastewater  
 SW - Surface Water  
 SO - Soil  
 SL - Sludge SED  
 LIQ - Other Liquid AIR  
 Au  
 SOL - Other Solid WP  
 Wpe  
 FB-Field Blank EB-  
 Equipment Blank  
 RB-Flow Blank TB-  
 Trip Blank  
 LAB USE ONLY

Lab Sample #	Field ID / Point of Collection	MECHSDI Unit #	Date	Time	Sampled by	Matrix	# of bottles	Number of Laboratory Tests	Analysis	Comments / Special Instructions
MW-55013-0-5-202201						SO	1	1	X	
MW-55013-5-10-202201						SO	1	1	X	
MW-55013-10-15-202201						SO	1	1	X	
MW-55013-15-20-202201						SO	1	1	X	
MW-55013-20-25-202201						SO	1	1	X	
MW-55013-25-30-202201						SO	1	1	X	
MW-56013-0-5-202201						SO	1	1	X	
MW-56013-5-10-202201						SO	1	1	X	
MW-56013-10-15-202201						SO	1	1	X	
MW-56013-15-20-202201						SO	1	1	X	
MW-56013-20-25-202201						SO	1	1	X	
MW-56013-25-30-202201						SO	1	1	X	
MW-60813-0-5-202204			4/1/22	1320	URT	SO	1	1	X	
MW-60813-5-10-202201						SO	1	1	X	
MW-60813-10-15-202201						SO	1	1	X	

Std. 10 Business Days  
☐ 5 Day RUSH  
☐ 3 Day RUSH  
☐ 2 Day RUSH  
☐ 1 Day RUSH  
☐ other  
 Emergency & Rush T&A rates available via LabLink

Approved by (SGS Project Manager) (Date)  
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Commercial "A" (Level 1)  
 Commercial "B" (Level 2)  
 FULLT1 (Level 3+4)  
 NJ Reduced  
 x REDT1  
 Commercial "C"  
 NJ Data of Known Quality Protocol Reporting  
 Commercial "A" = Results Only Commercial "B" = Results + QC Summary  
 (NJ) Reduced = Results + QC Summary + Partial Raw Data

NYASP Category A  
 NYASP Category B  
 State Forms  
 EDD Format SHA EQuIS; Statens EQuIS  
 Other

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**5** 5.1

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**CHAIN OF CUSTODY**  
 SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499

Page 3 of 4  
 Please merge with SDG: **JD42497**

Company Name <b>Sanborn Head &amp; Associates</b>		Project Name <b>Evergreen Marcus Hook</b>		Matrix Codes	
Street Address <b>1015 Virginia Dr. Suite 100</b>		Street <b>100 Gullam Street</b>		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED Sediment Ch - Oil LIQ - Other Liquid AIR Air SOL - Other Solid WP Waste FB - Field Blank EB Equipment Blank RB - Rinse Blank TB Trip Blank	
City State Zip <b>Fort Washington PA 19074</b>		City State Zip <b>Marble Hill PA 19061</b>			
Project (State) Email <b>Whitney@sanbornhead.com</b>		Project # <b>4862.04</b>			
Phone # <b>603-415-8159</b>		Client Purchase Order #			
Sample(s) Name(s)		Project Manager <b>Chelsey Shepsko</b>		LAB USE ONLY	
Lab Sample #	Field ID / Point of Collection	MECH/Ch Vol #	Date	Time	Sampled by
	<b>ATMS-INT-23-001-20-25-202204</b>				<b>SO</b>
	<b>WHT-INT-22-001-23-30-202204</b>				<b>SO</b>
<b>28</b>	<b>EB-01 20220406</b>		<b>4/6/22</b>	<b>1300</b>	<b>LRT</b>
<b>24</b>	<b>MW-608D-15-10-MS 2010406</b>		<b>4/6/22</b>	<b>0900</b>	<b>LRT</b>
	<b>MW-608D-15-10-MS-2010406</b>		<b>4/6/22</b>	<b>0900</b>	<b>LRT</b>
<b>29</b>	<b>MW-608D-15-10-1D-2020406</b>		<b>4/6/22</b>	<b>0900</b>	<b>LRT</b>
<b>30</b>	<b>MW-608D-65-40-2010406</b>		<b>4/6/22</b>	<b>0910</b>	<b>LRT</b>

Turnaround Time (Business days)  
 Std: 10 Business Days  
 5 Day RUSH  
 3 Day RUSH  
 2 Day RUSH  
 1 Day RUSH  
 Other \_\_\_\_\_  
 Emergency & Rush TIA data available via LabLink

Approved by (SGS Project Manager) Date: \_\_\_\_\_  
 Commercial "A" (Level 1) NYASP Category A  
 Commercial "B" (Level 2) NYASP Category B  
 FULLT1 (Level 3+4) State Forms  
 NJ Reduced  
 x REDT1 x EDD Firewise SHA EQUS; Stannac EQUS  
 Commercial "C"  
 NJ Data of Known Quality Protocol Reporting  
 Commercial "A" - Results Only Commercial "B" - Results - QC Summary  
 NJ Reduced - Results - QC Summary - Partial Raw data

Comments / Special instructions

Date: **4/6/22** Time: **1430**  
 Received by: **Robert Pung**  
 Received by: \_\_\_\_\_  
 Received by: \_\_\_\_\_

Date: **4/5/22** Time: **1710**  
 Received by: **Robert Pung**  
 Received by: \_\_\_\_\_  
 Received by: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Received by: \_\_\_\_\_

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JD42497: Chain of Custody  
Page 7 of 10

5.1

## SGS Sample Receipt Summary

**Job Number:** JD42497      **Client:** SANBORN HEAD & ASSOCIATES, INC.      **Project:** SANHPAFW: MARCUS HOOK, PA  
**Date / Time Received:** 4/5/2022 4:51:00 PM      **Delivery Method:**      **Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 1: (1.5);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Cooler temp verification:	IR Gun
3. Cooler media:	Ice (Bag)
4. No. Coolers:	1

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Test Strip Lot #s:</b>	pH 1-12: 231619	pH 12+: 203117A	Other: (Specify)
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Comments

SM089-03  
Rev. Date 12/7/17

**JD42497: Chain of Custody**  
**Page 9 of 10**

## SGS Sample Receipt Summary

**Job Number:** JD42497      **Client:** SANBORN HEAD & ASSOCIATES, INC.      **Project:** SANHPAFW: MARCUS HOOK, PA  
**Date / Time Received:** 4/6/2022 5:10:00 PM      **Delivery Method:** \_\_\_\_\_      **Airbill #'s:** \_\_\_\_\_

**Cooler Temps (Raw Measured) °C:** Cooler 2: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 2: (2.8);

<b>Cooler Security</b>	<b>Y or N</b>
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<b>Cooler Temperature</b>	<b>Y or N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Cooler temp verification:	IR Gun
3. Cooler media:	Ice (Bag)
4. No. Coolers:	1

<b>Quality Control Preservation</b>	<b>Y or N</b>	<b>N/A</b>
1. Trip Blank present / cooler:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
4. VOCs headspace free:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<b>Y or N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/> <input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y or N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Condition of sample:	Intact

<b>Sample Integrity - Instructions</b>	<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>

**Test Strip Lot #s:**      pH 1-12: 231619      pH 12+: 203117A      Other: (Specify) \_\_\_\_\_

Comments

SM089-03  
 Rev. Date 12/7/17

**JD42497: Chain of Custody**  
**Page 10 of 10**



## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name: Evergreen Resources Group  
Site/Project Name: SANHPAFW: Marcus Hook, PA  
Job Number/Task/Subtask: 4862.04  
Laboratory/Location: SGS / Dayton, NJ  
SDG: JD42497  
Sample Collection Dates: April 4, 5, and 6, 2022

EnvStd Project Manager: Ammie Martin  
Reviewed by: Tom Weinmann  
Approved by: Ammie Martin  
Completion Date: 06/2022  
Validation Level: 2B

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

Parameter/ Method	Criteria Examined in Detail							Problems Identified						
	<b>Note:</b> All items examined have been included in the Support Document unless otherwise noted.													
	Check (✓) if Yes or Footnote Letter for Comments Below													
	6010D							6010D						
Condition upon Receipt	✓													
Sample Preservation	✓													
Holding Times	✓													
Blank Analysis Results	✓													
Laboratory Control Sample	✓													
Matrix Spike (Pre-Digestion Spike)	✓													
Laboratory Duplicate														
Field Duplicate	✓													
Total vs. Dissolved Results Comparison														
Sample Preparation	✓													
Mass Tuning														
Initial Calibrations	✓													
Continuing Calibrations	✓													
Detection Limit/Reporting Limit Standards	✓													
Negative Bias	✓													
Interference Checks	✓													
Post-Digestion Spike														
Serial Dilution	✓							✓						
Analytical Sequence	✓													
Linear Range Analysis														
Interelement Correction Factors														
Detection Limit/Sensitivity	✓													
Dilutions	✓													
Internal Standard Performance														
Quantitation of Results														
Multiple Exposures %RSD														
Percent Solids	✓													
Deliverable was Complete	✓													
Others:														

**Comments:** Quantitation of Results and Multiple Exposures are not included in the Support Documentation unless a problem was identified.

# Project Checklist Form

IMS Form 001



## Flat File Validation Checklist

Main fields in flat file that may change

result_text	√	detected value becomes non-detect, remove value in this field and highlight red, otherwise leave as is	THW 5/31/22
result_numeric	√	detected value becomes non-detect, remove value in this field and highlight red, otherwise leave as is	THW 5/31/22
reporting_detection_limit	√	does this value change? If so, change and highlight red, if not, leave as is	THW 5/31/22
method_detection_limit	√	check for correct limit, if this changes, highlight red, if not, leave as is	THW 5/31/22
quantitation_limit	√	check for correct limit, if this changes, highlight red, if not, leave as is	THW 5/31/22
detect_flag	√	detected value to become non-detect, change from Y to N and highlight red, otherwise leave as is	THW 5/31/22
validator_qualifiers	√	apply appropriate validation qualifiers in this field	THW 5/31/22
interpreted_qualifiers	√	copy validator_qualifiers and any lab_qualifiers that may remain to be reported (this is the final, reportable qualifier)	THW 5/31/22
reportable_result	√	if validation results in result to become not reportable, change from "Yes" to "No"	THW 5/31/22
approval_code	√	change approval code to SH-USB	THW 5/31/22
approval_a	√	apply appropriate reason code, one per field, first code here (See Validation Codes tab)	THW 5/31/22
approval_b	√	apply appropriate reason code, one per field, second code here (See Validation Codes tab)	THW 5/31/22
approval_c	√	apply appropriate reason code, one per field, third code here (See Validation Codes tab)	THW 5/31/22
approval_d	√	apply appropriate reason code, one per field, fourth code here (See Validation Codes tab)	THW 5/31/22
validated_yn	√	change from "N" to "Y" for applicable validations (individual records)	THW 5/31/22



[illegible]

**NOTES:**

<b>Qual:</b>	Qualifier(s) based on evaluation(s) other than Total/ vs. Dissolved comparison, if applicable (J, U, U* or B)
<b>RPD:</b>	Relative Percent Difference
<b>QL:</b>	Quantitation Limit
<b>MDL:</b>	Method Detection Limit
<b>RL:</b>	Reporting Limit. RL = QL for QL reporting and MDL for MDL reporting
<b>J:</b>	The analyte concentration should be considered estimated
<b>U:</b>	The analyte was not detected in the sample at or above the RL indicated. The RL will be used for comparison purposes.
<b>UJ:</b>	The analyte was not detected in the sample at or above the Reporting Limit Indicated. The RL is approximate.
<b>R:</b>	The analyte was analyzed for and detected, but sample results are unreliable. The presence or absence of the analyte cannot be verified.
<b>UR:</b>	The analyte was analyzed for and not detected, but the determination that the analyte was not present in the sample is unreliable. The presence or absence of the analyte cannot be verified.
<b>U*</b>	The result was blank qualified. The RL will be used for comparison purposes.
<b>NA:</b>	The MDL (for QL reporting), RPD or Difference is not applicable

**Comments:**

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-608D\_0-5\_20220404

Lab Sample ID: JD42497-1

Matrix: SO - Soil

Date Sampled: 04/04/22

Date Received: 04/05/22

Percent Solids: 76.4

Project: SANHPAFW: Marcus Hook, PA

4.1

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	85.2	5.2	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	34800	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	MW-609D_0-5_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-2	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	77.5
Project:	SANHPAFW: Marcus Hook, PA		

4.2  
4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	153	5.1	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	34600	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-609D\_5-10\_20220405

Lab Sample ID: JD42497-3

Matrix: SO - Soil

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 65.2

Project: SANHPAFW: Marcus Hook, PA

4.3

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.3	3.1	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16800	77	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-609D\_10-15\_20220405

Lab Sample ID: JD42497-4

Matrix: SO - Soil

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 69.3

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	13.8	5.6	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	30300	140	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-609D_15-20_20220405	Date Sampled:	04/05/22
Lab Sample ID:	JD42497-5	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	82.3
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	409	12	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	74700	300	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-609D\_20-25\_20220405

Lab Sample ID: JD42497-6

Matrix: SO - Soil

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 89.3

Project: SANHPAFW: Marcus Hook, PA

4.6

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.8	2.3	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16200	57	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-609D\_25-30\_20220405

Lab Sample ID: JD42497-7

Matrix: SO - Soil

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 67.8

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	399	15	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	144000	380	mg/kg	5	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-609D_30-35_20220405	Date Sampled:	04/05/22
Lab Sample ID:	JD42497-8	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	66.4
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10400	31	mg/kg	10	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	24400	78	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	AOI7-BH-22-001_0-5_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-9	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	87.1
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	< 4.4	4.4	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	32300	110	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	AOI7-BH-22-001_5-10_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-10	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	75.2
Project:	SANHPAFW: Marcus Hook, PA		

4.10

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.2	2.6	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	17700	65	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	AOI7-BH-22-001_10-15_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-11	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	59.8
Project:	SANHPAFW: Marcus Hook, PA		

4.11

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.9	3.4	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	12400	84	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	AOI7-BH-22-001_15-20_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-12	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	73.4
Project:	SANHPAFW: Marcus Hook, PA		

4.12

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	12.6	5.3	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	27900	130	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: AOI7-BH-22-001\_20-25\_20220404

Lab Sample ID: JD42497-13

Matrix: SO - Soil

Date Sampled: 04/04/22

Date Received: 04/05/22

Percent Solids: 64.9

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8270	30	mg/kg	10	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	23600	74	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	AOI7-BH-22-001_25-30_20220404	Date Sampled:	04/04/22
Lab Sample ID:	JD42497-14	Date Received:	04/05/22
Matrix:	SO - Soil	Percent Solids:	56.4
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1310	3.4	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	32200	84	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-609D\_35-40\_20220405

Lab Sample ID: JD42497-15

Matrix: SO - Soil

Project: SANHPAFW: Marcus Hook, PA

Date Sampled: 04/05/22

Date Received: 04/05/22

Percent Solids: 65.5

4.15

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1330	6.4	mg/kg	2	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	26600	80	mg/kg	1	04/07/22	04/08/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52194

(2) Prep QC Batch: MP32168

RL = Reporting Limit



## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-608D_5-10_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-22	Date Received:	04/06/22
Matrix:	SO - Soil	Percent Solids:	78.5
Project:	SANHPAFW: Marcus Hook, PA		

4.16  
4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	38.3	2.4	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	23700	61	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52207

(2) Prep QC Batch: MP32224

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-608D_10-15_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-23	Date Received:	04/06/22
Matrix:	SO - Soil	Percent Solids:	80.1
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	33.4	2.5	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	24600	62	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52207

(2) Prep QC Batch: MP32224

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-608D_15-20_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-24	Date Received:	04/06/22
Matrix:	SO - Soil	Percent Solids:	84.2
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	21.1	12	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37200	300	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-608D\_20-25\_20220406

Lab Sample ID: JD42497-25

Matrix: SO - Soil

Date Sampled: 04/06/22

Date Received: 04/06/22

Percent Solids: 87.3

Project: SANHPAFW: Marcus Hook, PA

4.19

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10.7	2.3	mg/kg	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	21000	57	mg/kg	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52222

(2) Prep QC Batch: MP32248

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-608D_25-30_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-26	Date Received:	04/06/22
Matrix:	SO - Soil	Percent Solids:	80.3
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	112	4.9	mg/kg	2	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	28000	120	mg/kg	2	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-608D\_30-35\_20220406

Lab Sample ID: JD42497-27

Matrix: SO - Soil

Date Sampled: 04/06/22

Date Received: 04/06/22

Percent Solids: 66.2

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14800	58	mg/kg	20	04/09/22	04/12/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Iron	18800	73	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

(1) Instrument QC Batch: MA52207

(2) Instrument QC Batch: MA52215

(3) Prep QC Batch: MP32224

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	EB-01_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-28	Date Received:	04/06/22
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Project:	SANHPAFW: Marcus Hook, PA		

## Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	< 3.0	3.0	ug/l	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	< 100	100	ug/l	1	04/12/22	04/13/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52223

(2) Prep QC Batch: MP32253

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-608D_15-20_FD_20220406	Date Sampled:	04/06/22
Lab Sample ID:	JD42497-29	Date Received:	04/06/22
Matrix:	SO - Soil	Percent Solids:	86.0
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	27.3	11	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	43800	280	mg/kg	5	04/09/22	04/12/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52215

(2) Prep QC Batch: MP32224

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



## Report of Analysis

Client Sample ID: MW-608D\_35-40\_20220406

Lab Sample ID: JD42497-30

Matrix: SO - Soil

Date Sampled: 04/06/22

Date Received: 04/06/22

Percent Solids: 68.8

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10900	30	mg/kg	10	04/09/22	04/12/22 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Iron	24100	74	mg/kg	1	04/09/22	04/11/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

(1) Instrument QC Batch: MA52207

(2) Instrument QC Batch: MA52215

(3) Prep QC Batch: MP32224

RL = Reporting Limit

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:28	MA52194-STD1	1		STDA
06:33	MA52194-STD2	1		STDB
06:38	MA52194-ICV1	1		
06:46	MA52194-ICB1	1		
06:57	MA52194-ICCV1	1		
07:07	MA52194-CCB1	1		
07:26	MA52194-CRI1	1		
07:31	MA52194-CRID1	1		
07:36	MA52194-ICSA1	1		
07:41	MA52194-ICSAB1	1		
07:46	MA52194-HSTD1	1		
07:52	MA52194-HSTD2	1		
07:57	ZZZZZZ	1		
08:02	ZZZZZZ	1		
08:07	ZZZZZZ	1		
08:12	MA52194-CCV1	1		
08:17	MA52194-CCB2	1		
08:23	MP32168-MB1	1		
08:28	MP32168-B1	1		
08:33	MP32168-S1	1		
08:37	MP32168-S2	1		
08:42	JD42497-6	1		
08:47	MP32168-SD1	5		
08:52	JD42497-1	1		
08:57	JD42497-2	1		
09:02	JD42497-3	1		
09:07	MA52194-CCV2	1		
09:12	MA52194-CCB3	1		
09:18	JD42497-4	1		
09:23	JD42497-5	1		
09:28	JD42497-7	1		
09:32	JD42497-8	1		Fe
09:37	JD42497-9	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:42	JD42497-10	1		
09:47	JD42497-11	1		
09:52	JD42497-12	1		
09:57	JD42497-13	1		Fe
10:02	MA52194-CCV3	1		
10:07	MA52194-CCB4	1		
10:12	MP32131-SD1	5		
10:18	JD42497-14	1		
10:23	JD42497-15	1		Fe
10:27	JD42497-1	2		
10:32	JD42497-2	2		
10:38	JD42497-4	2		
10:43	JD42497-5	5		
10:48	JD42497-7	5		
10:53	JD42497-8	10		As high rsd
10:58	MA52194-CCV4	1		
11:03	MA52194-CCB5	1		
11:08	JD42497-9	2		
11:13	JD42497-12	2		
11:18	JD42497-13	10		As
11:23	JD42497-15	2		As
11:28	JD42497-8	20		
----->	Last reportable sample/prep for job JD42497			
11:33	ZZZZZZ	1		
11:38	MA52194-CRI2	1		
11:59	MA52194-ICSA2	1		
12:04	MA52194-ICSAB2	1		
12:09	MA52194-CCV5	1		
12:14	MA52194-CCB6	1		
----->	Last reportable CCB for job JD42497			
12:19	ZZZZZZ	1		
12:24	MP32169-S1	2		
12:29	MP32169-S2	2		
12:34	JD41986-14	2		(sample used for QC only; not part of login JD42497)
12:39	MP32169-SD1	10		

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Element: Dilution	As	Fe
06:38	MA52194-ICV1	1	X	X
06:46	MA52194-ICB1	1	X	X
06:57	MA52194-ICCV1	1	X	X
07:07	MA52194-CCB1	1	X	X
07:26	MA52194-CRI1	1	X	X
07:31	MA52194-CRID1	1	X	X
07:36	MA52194-ICSA1	1	X	X
07:41	MA52194-ICSAB1	1	X	X
07:46	MA52194-HSTD1	1	X	X
07:52	MA52194-HSTD2	1	X	X
07:57	ZZZZZZ	1		
08:02	ZZZZZZ	1		
08:07	ZZZZZZ	1		
08:12	MA52194-CCV1	1	X	X
08:17	MA52194-CCB2	1	X	X
08:23	MP32168-MB1	1	X	X
08:28	MP32168-B1	1	X	X
08:33	MP32168-S1	1	X	X
08:37	MP32168-S2	1	X	X
08:42	JD42497-6	1	X	X
08:47	MP32168-SD1	5	X	X
08:52	JD42497-1	1		
08:57	JD42497-2	1		
09:02	JD42497-3	1	X	X
09:07	MA52194-CCV2	1	X	X
09:12	MA52194-CCB3	1	X	X
09:18	JD42497-4	1		
09:23	JD42497-5	1		
09:28	JD42497-7	1		
09:32	JD42497-8	1		X
09:37	JD42497-9	1		
09:42	JD42497-10	1	X	X
09:47	JD42497-11	1	X	X
		Element: Dilution	As	Fe

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Element: Dilution	Fe
09:52	JD42497-12	1	
09:57	JD42497-13	1	X
10:02	MA52194-CCV3	1	X X
10:07	MA52194-CCB4	1	X X
10:12	MP32131-SD1	5	
10:18	JD42497-14	1	X X
10:23	JD42497-15	1	X
10:27	JD42497-1	2	X X
10:32	JD42497-2	2	X X
10:38	JD42497-4	2	X X
10:43	JD42497-5	5	X X
10:48	JD42497-7	5	X X
10:53	JD42497-8	10	X
10:58	MA52194-CCV4	1	X X
11:03	MA52194-CCB5	1	X X
11:08	JD42497-9	2	X X
11:13	JD42497-12	2	X X
11:18	JD42497-13	10	X
11:23	JD42497-15	2	X
11:28	JD42497-8	20	
11:33	ZZZZZZ	1	
11:38	MA52194-CRI2	1	X X
11:59	MA52194-ICSA2	1	X X
12:04	MA52194-ICSAB2	1	X X
12:09	MA52194-CCV5	1	X X
12:14	MA52194-CCB6	1	X X
12:19	ZZZZZZ	1	
12:24	MP32169-S1	2	X
12:29	MP32169-S2	2	X
12:34	JD41986-14	2	X (a)
12:39	MP32169-SD1	10	X
12:44	ZZZZZZ	2	
12:49	ZZZZZZ	5	
		Element:	Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/08/22  
Run ID: MA52194

Methods: SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:28	MA52194-STD1	2229 R	76938 R	2668 R	5905 R
06:33	MA52194-STD2	2150	73976	2666	5600
06:38	MA52194-ICV1	2189	75390	2653	5674
06:46	MA52194-ICB1	2236	76874	2609	5914
06:57	MA52194-ICCV1	2198	75972	2733	5699
07:07	MA52194-CCB1	2227	77622	2710	5894
07:26	MA52194-CRI1	2212	76782	2731	5844
07:31	MA52194-CRID1	2230	77099	2737	5891
07:36	MA52194-ICSA1	2040	70623	2693	5316
07:41	MA52194-ICSAB1	2042	70544	2704	5330
07:46	MA52194-HSTD1	2201	76611	2736	5933
07:52	MA52194-HSTD2	2078	71500	2654	5368
07:57	ZZZZZZ	2231	78187	2765	6068
08:02	ZZZZZZ	2210	77950	2777	5967
08:07	ZZZZZZ	2276	78736	2791	6024
08:12	MA52194-CCV1	2180	75738	2735	5658
08:17	MA52194-CCB2	2235	78245	2758	5926
08:23	MP32168-MB1	2217	78298	2799	5887
08:28	MP32168-B1	2210	76784	2778	5776
08:33	MP32168-S1	2283	78674	2933	5794
08:37	MP32168-S2	2287	78767	2928	5808
08:42	JD42497-6	2505	86483	3166	5915 ✓
08:47	MP32168-SD1	2362	81918	2920	5920
08:52	JD42497-1	No results reported for the elements associated with this internal standard.			
08:57	JD42497-2	2394	80218	3080	5871
09:02	JD42497-3	2304	79688	2948	5724 ✓
09:07	MA52194-CCV2	2198	76276	2767	5702
09:12	MA52194-CCB3	2249	78314	2774	5956
09:18	JD42497-4	2316	80269	2953	5969
09:23	JD42497-5	2275	79626	2971	6152
09:28	JD42497-7	2592	89607	3400	6512
09:32	JD42497-8	2384	83109	3093	5770 ✓
09:37	JD42497-9	2242	77778	2852	5864

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/08/22 Methods: SW846 6010D  
Run ID: MA52194

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	
09:42	JD42497-10	2308	78191	2939	5800	✓
09:47	JD42497-11	2289	78091	2913	5707	✓
09:52	JD42497-12	2277	79590	2916	5818	
09:57	JD42497-13	2340	80644	2982	5889	✓
10:02	MA52194-CCV3	2192	75361	2769	5701	
10:07	MA52194-CCB4	2228	76435	2729	5916	
10:12	MP32131-SD1	2232	77755	2796	5920	
10:18	JD42497-14	2395	82310	3030	5935	✓
10:23	JD42497-15	2380	81880	3052	5904	✓
10:27	JD42497-1	2344	79423	2906	5959	✓
10:32	JD42497-2	2317	78312	2956	5813	✓
10:38	JD42497-4	2270	77933	2866	5893	✓
10:43	JD42497-5	2253	77728	2833	5940	✓
10:48	JD42497-7	2319	79270	2861	6008	✓
10:53	JD42497-8	2259	77878	2776	5871	✓
10:58	MA52194-CCV4	2198	74797	2800	5705	
11:03	MA52194-CCB5	2245	77804	2768	5947	
11:08	JD42497-9	2220	77228	2849	5783	✓
11:13	JD42497-12	2263	78434	2944	8632 !	
11:18	JD42497-13	2272	78406	2834	5934	✓
11:23	JD42497-15	2297	79233	2929	16390 !	
11:28	JD42497-8	2243	77799	2811	5875	
11:33	ZZZZZZ	2222	77554	2795	5871	
11:38	MA52194-CRI2	2217	76909	2782	5838	
11:59	MA52194-1CSA2	2016	70018	2733	5236	
12:04	MA52194-ICSAB2	2029	69876	2729	5294	
12:09	MA52194-CCV5	2209	76727	2846	5711	
12:14	MA52194-CCB6	2250	77468	2831	5940	
12:19	ZZZZZZ	2216	76869	2832	5763	
12:24	MP32169-S1	2654	89031	3392	5853	
12:29	MP32169-S2	2351	79599	3026	5862	
12:34	JD41986-14	2355	80956	3007	6017	
12:39	MP32169-SD1	2252	78043	2821	6085	

= Indium

No impact

6.1.2

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SF040822M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/08/23  
Run ID: MA52194

Methods: SW846 6010D  
Units: ug/l

Time: Sample ID:			06:46 ICB1	07:07 CCB1		08:17 CCB2		09:12 CCB3		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	9.2								
Antimony	6.0	2.8								
Arsenic	3.0	2.6	-1.40	<3.0	0.400	<3.0	-1.40	<3.0	-1.00	<3.0
Barium	200	.2								
Beryllium	1.0	.2								
Bismuth	20	2.5								
Boron	100	1.8								
Cadmium	3.0	.4								
Calcium	5000	13								
Cerium	100									
Chromium	10	.7								
Cobalt	50	.6								
Copper	10	.7								
Iron	100	3.3	5.20	<100	5.10	<100	11.3	<100	8.50	<100
Lead	3.0	2								
Lithium	50	1.5								
Magnesium	5000	25								
Manganese	15	.1								
Molybdenum	20	.6								
Nickel	10	.8								
Phosphorus	50	7								
Potassium	10000	35								
Selenium	10	3.6								
Silicon	200	2.2								
Silver	10	.6	and							
Sodium	10000	14								
Strontium	10	.1								
Sulfur	50	3.7								
Thallium	10	5.2								
Tin	10	1.4								
Titanium	10	.8								
Tungsten	50	1.3								
Vanadium	50	.5								

6.1.3  
6

No impact



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: result < RL Run ID: MA52194 Units: ug/l

Metal	RL	IDL	Time: Sample ID:	10:07 CCB4	11:03 CCB5	12:14 CCB6	
				raw	final	raw	
Aluminum	200	9.2					
Antimony	6.0	2.8					
Arsenic	3.0	2.6		-0.400	<3.0	-1.00	<3.0
Barium	200	.2					
Beryllium	1.0	.2					
Bismuth	20	2.5					
Boron	100	1.8					
Cadmium	3.0	.4					
Calcium	5000	13					
Cerium	100						
Chromium	10	.7					
Cobalt	50	.6					
Copper	10	.7					
Iron	100	3.3		8.30	<100	9.70	<100
Lead	3.0	2					
Lithium	50	1.5					
Magnesium	5000	25					
Manganese	15	.1					
Molybdenum	20	.6					
Nickel	10	.8					
Phosphorus	50	7					
Potassium	10000	35					
Selenium	10	3.6					
Silicon	200	2.2					
Silver	10	.6		anr			
Sodium	10000	14					
Strontium	10	.1					
Sulfur	50	3.7					
Thallium	10	5.2					
Tin	10	1.4					
Titanium	10	.8					
Tungsten	50	1.3					
Vanadium	50	.5					

no impact

6.13  
6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
Matrix Type: SOLID

Methods: SW846-6010D  
Units: mg/kg

Prep Date:

04/07/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	.92	8.1		
Antimony	2.0	.28	.41		
Arsenic	2.0	.26	.28	0.64	<2.0
Barium	20	.02	1.9		
Beryllium	0.20	.02	.08		
Bismuth	2.0	.25	.52		
Boron	10	.18	3.7		
Cadmium	0.50	.04	.07		
Calcium	500	1.3	21		
Chromium	1.0	.07	.37		
Cobalt	5.0	.06	.28		
Copper	2.5	.07	.84		
Iron	50	.33	19	18.4	<50
Lead	2.0	.2	.41		
Lithium	5.0	.15	.92		
Magnesium	500	2.5	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.06	.32		
Nickel	4.0	.08	.35		
Phosphorus	20	.7	3.3		
Potassium	1000	3.5	32		
Selenium	2.0	.36	.65		
Silicon	20	.22	11		
Silver	0.50	.06	.17		
Sodium	1000	1.4	78		
Strontium	5.0	.01	.18		
Sulfur	10	.37	3.9		
Thallium	1.0	.52	.58		
Tin	20	.14	3.8		
Titanium	1.0	.08	.34		
Tungsten	5.0	.13	1.8		
Vanadium	5.0	.05	.19		
Zinc	5.0	.03	2.3		

Samples 1-15

No impact

6.8.1

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
QC Limits: to % Recovery Run ID: MA52194 Units: ug/l

Time:	06:57
Sample ID:	ICCV
Metal	True
Results	% Rec

Aluminum			
Antimony			
Arsenic	2000	1890	94.5
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron	40000	39200	98.0
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver	anr		
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW646 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time:	06:38	08:12	09:07						
Sample ID:	ICV	CCV	CCV						
Metal	True	Results % Rec	True	Results % Rec	True	Results % Rec			
Aluminum									
Antimony									
Arsenic	2000	1960	98.0	2000	1900	95.0			
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Cerium									
Chromium									
Cobalt									
Copper									
Iron	40000	40300	100.8	40000	39200	98.0	40000	38900	97.3
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver	ant								
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									

6.1.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52194      Units: ug/l

Time:		10:02		10:58		12:09			
Sample ID:		CCV3		CCV4		CCV5			
Metal	CCV	Results	% Rec	CCV	Results	% Rec	CCV	Results	% Rec
Aluminum									
Antimony									
Arsenic	2000	1910	95.5	2000	1950	97.5	2000	1920	96.0
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Cerium									
Chromium									
Cobalt									
Copper									
Iron	40000	38200	95.5	40000	38800	97.0	40000	39000	97.5
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver	and								
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									

6.1.5  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/09/22 Methods: SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52194 Units: ug/l

Time:		07:46		07:52	
Sample ID:		HSTD	HSTD1	HSTD	HSTD2
Metal		True	Results % Rec	True	Results % Rec

Aluminum					
Antimony					
Arsenic	8000	7330	91.6		
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron				200000	191000 95.5
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver	ant				
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					

6.1.6  
6

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP Date Analyzed: 04/08/22 Methods: SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52194 Units: ug/l

Time:				07:26		07:31		11:38	
Sample ID:	CRI	CRIA	CRID	CR11		CR11		CR12	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	6.90	86.3			6.60	82.5
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0						
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500		109	109.0			112	112.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0						
Molybdenum	20								
Nickel	10		4.0						
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000						
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF040822M1.ICP      Date Analyzed: 04/08/22      Methods: SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52194      Units: ug/l

Time:	Sample ID:	ICSA	ICSA2	07:36	07:41	11:59	12:04	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	494000	98.8	498000	99.6	500000	100.0
Antimony		1000	4.60		1010	101.0	-0.100	
Arsenic		1000	0.00		995	99.5	-0.900	
Barium		500	4.60		489	97.8	4.60	
Beryllium		500	0.300		482	96.4	0.300	
Bismuth		500	-2.90		509	101.8	-3.80	
Boron		500	1.30		497	99.4	1.50	
Cadmium		1000	0.100		1030	103.0	0.100	
Calcium	400000	400000	373000	93.3	382000	95.5	376000	94.0
Cerium			36.2		514*		39.4	
Chromium		500	-0.800		477	95.4	-0.700	
Cobalt		500	0.700		471	94.2	0.400	
Copper		500	0.00		523	104.6	0.300	
Iron	200000	200000	185000	92.5	192000	96.0	187000	93.5
Lead		1000	-0.100		940	94.0	3.00*	
Lithium		500	-1.90		550	110.0	-8.00	
Magnesium	500000	500000	486000	97.2	484000	96.8	492000	98.4
Manganese		500	11.6		514	102.8	11.3	
Molybdenum		500	0.900		469	93.8	1.30	
Nickel		1000	2.40		934	93.4	2.30	
Phosphorus		500	10.6		493	98.6	11.4	
Potassium			57.2		57.8		83.2	
Selenium		1000	9.30		954	95.4	8.80	
Silicon		500	-16.1		509	101.8	-15.6	
Silver		1000	3.70		1050	105.0	3.60	
Sodium			3.60		6.80		-1.00	
Strontium		500	-1.20		494	98.8	-1.10	
Sulfur		500	19.4		513	102.6	19.1	
Thallium		1000	-6.90		923	92.3	-3.30	
Tin		500	-6.50		454	90.8	-5.80	
Titanium		500	-1.60		475	95.0	-1.50	
Tungsten		500	-4.70		480	96.0	-5.80	
Vanadium		500	-0.900		480	96.0	-1.00	

2.6

6.1.8  
6



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNCCOSS - Sunoco/Evergreen  
 Project: SANHFAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	JD42497-6		Spikelet		QC	
	Original MS		MPSPK2		Rec Limits	
Aluminum						
Antimony						
Arsenic	5.8	212	224	92.1	75-125	
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron	16200	20400	2800	150.0(a)	75-125	>4x
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						

6.8.2  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/07/22

Metal	JD42497-6 Original MSD	Spikelot NPSPK2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	5.8	203	226	87.2	4.3
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron	16200	20500	2830	152.1(a)	0.5
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc					

>4x

6.8.2  
6

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32168  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/07/22

Metal	BSP Result	Spikelet MSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	188	200	94.0	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron	2550	2500	102.0	80-120
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHEAFW: Marcus Hook, PA

QC Batch ID: MP32168  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/07/22

Metal	JD42497-6 Original SDL 1:5	%DIF	QC Limits
Aluminum			
Antimony			
Arsenic	50.6	47.9	5.3 0-10
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron	142000	158000	11.8% (a) 0-10
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			
Zinc			

6.8.4  
6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:58	MA52207-STD1	1		STDA
09:03	MA52207-STD2	1		STDB
09:08	MA52207-ICV1	1		
09:16	MA52207-ICB1	1		
09:21	MA52207-CRI1	1		
09:27	MA52207-ICCV1	1		
09:35	MA52207-CCB1	1		
09:40	MA52207-CRI2	1		
09:45	MA52207-CRID1	1		
09:50	MA52207-ICSA1	1		
09:55	MA52207-ICSAB1	1		
10:00	MA52207-HSTD1	1		
10:06	MA52207-HSTD2	1		
10:11	ZZZZZZ	1		
10:16	ZZZZZZ	1		
10:21	ZZZZZZ	1		
10:27	MA52207-CCV1	1		
10:31	MA52207-CCB2	1		
10:37	MP32224-MB1	1		Zn RL raised 3X
10:42	MP32224-B1	1		
10:47	MP32224-S1	1		FE high
10:52	MP32224-S2	1		FE high
10:57	JD42497-24	1		FE high
11:02	MP32224-SD1	5		FE high
11:07	MP32224-PS1	1		FE high
11:12	JD42497-22	1		
11:17	JD42497-23	1		
11:22	MA52207-CCV2	1		
11:27	MA52207-CCB3	1		
11:32	JD42497-26	1		FE high
11:37	JD42497-27	1	Fe	AS high
11:42	JD42497-29	1		FE high
11:47	JD42497-30	1	Fe	AS high
Last reportable sample/prep for job JD42497				

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:52	ZZZZZZ	1		
11:58	ZZZZZZ	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	5		
12:13	ZZZZZZ	1		
12:18	MA52207-CCV3	1		
12:23	MA52207-CCB4	1		
12:28	ZZZZZZ	1		
12:34	ZZZZZZ	1		
12:39	MP32222-B1	1		
12:43	MP32222-MB1	1		
12:49	ZZZZZZ	1		
12:54	MP32223-MB1	1		
12:59	MP32223-B1	1		
13:04	ZZZZZZ	1		
13:09	ZZZZZZ	1		
13:15	MA52207-CCV4	1		
13:20	MA52207-CCB5	1		
13:25	ZZZZZZ	1		
13:30	JD40449-12R	5		(sample used for QC only; not part of login JD42497)
13:35	MP32197-SD1	25		
13:40	ZZZZZZ	5		
13:45	ZZZZZZ	5		
13:51	ZZZZZZ	25		
13:56	ZZZZZZ	10		
14:01	ZZZZZZ	25		
14:06	ZZZZZZ	10		
14:11	ZZZZZZ	1		
14:16	MA52207-CCV5	1		
14:21	MA52207-CCB6	1		
14:26	MA52207-CRI3	1		
14:31	MA52207-ICSA2	1		
14:36	MA52207-ICSAB2	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Dilution PS Factor	Recov	Comments
14:41	ZZZZZZ	25		
14:46	ZZZZZZ	5		
14:51	ZZZZZZ	10		
14:56	ZZZZZZ	5		
15:01	ZZZZZZ	5		
15:06	ZZZZZZ	5		
15:11	MA52207-CCV6	1		
15:16	MA52207-CCB7	1		
----->	Last reportable CCB for job JD42497			
15:21	ZZZZZZ	5		
15:26	ZZZZZZ	5		
15:31	ZZZZZZ	5		
15:36	ZZZZZZ	25		
15:41	MP32197-S1	5		
15:46	MP32197-S2	5		
15:51	ZZZZZZ	25		
15:56	ZZZZZZ	5		
16:01	ZZZZZZ	1		
16:06	MA52207-CCV7	1		
16:11	MA52207-CCB8	1		
16:16	ZZZZZZ	2		
16:21	ZZZZZZ	5		
16:26	ZZZZZZ	2		
16:31	ZZZZZZ	5		
16:36	ZZZZZZ	1		
16:41	ZZZZZZ	5		
16:46	ZZZZZZ	5		
16:51	ZZZZZZ	5		
16:56	ZZZZZZ	5		
17:01	ZZZZZZ	5		
17:06	MA52207-CCV8	1		
17:11	MA52207-CCB9	1		
17:16	ZZZZZZ	2		
17:21	ZZZZZZ	2		

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52207

Time	Sample Description	Dilution	Element:	F
09:08	MA52207-ICV1	1	X	X
09:16	MA52207-ICB1	1	X	X
09:21	MA52207-CRI1	1	X	X
09:27	MA52207-ICCV1	1	X	X
09:35	MA52207-CCB1	1	X	X
09:40	MA52207-CRI2	1	X	X
09:45	MA52207-CRID1	1	X	X
09:50	MA52207-ICSA1	1	X	X
09:55	MA52207-ICSAB1	1	X	X
10:00	MA52207-HSTD1	1	X	X
10:06	MA52207-HSTD2	1	X	X
10:11	ZZZZZZ	1	X	X
10:16	ZZZZZZ	1	X	X
10:21	ZZZZZZ	1	X	X
10:27	MA52207-CCV1	1	X	X
10:31	MA52207-CCB2	1	X	X
10:37	MP32224-MB1	1	X	X
10:42	MP32224-B1	1	X	X
10:47	MP32224-S1	1	X	X
10:52	MP32224-S2	1	X	X
10:57	JD42497-24	1	X	X
11:02	MP32224-SD1	5	X	X
11:07	MP32224-PS1	1	X	X
11:12	JD42497-22	1	X	X
11:17	JD42497-23	1	X	X
11:22	MA52207-CCV2	1	X	X
11:27	MA52207-CCB3	1	X	X
11:32	JD42497-26	1	X	X
11:37	JD42497-27	1	X	X
11:42	JD42497-29	1	X	X
11:47	JD42497-30	1	X	X
11:52	ZZZZZZ	1	X	X
11:58	ZZZZZZ	1	X	X
			Element:	F
			Dilution	e



# REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52207

Time	Sample Description	Element: Dilution	F e
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	5	
12:13	ZZZZZZ	1	
12:18	MA52207-CCV3	1	X X
12:23	MA52207-CCB4	1	X X
12:28	ZZZZZZ	1	
12:34	ZZZZZZ	1	
12:39	MP32222-B1	1	X X
12:43	MP32222-MB1	1	X X
12:49	ZZZZZZ	1	
12:54	MP32223-MB1	1	X X
12:59	MP32223-B1	1	X X
13:04	ZZZZZZ	1	
13:09	ZZZZZZ	1	
13:15	MA52207-CCV4	1	X X
13:20	MA52207-CCB5	1	X X
13:25	ZZZZZZ	1	
13:30	JD40449-12R	5	(a)
13:35	MP32197-SD1	25	
13:40	ZZZZZZ	5	
13:45	ZZZZZZ	5	
13:51	ZZZZZZ	25	
13:56	ZZZZZZ	10	
14:01	ZZZZZZ	25	
14:06	ZZZZZZ	10	
14:11	ZZZZZZ	1	
14:16	MA52207-CCV5	1	X X
14:21	MA52207-CCB6	1	X X
14:26	MA52207-CRI3	1	X X
14:31	MA52207-ICSA2	1	X X
14:36	MA52207-ICSAB2	1	X X
14:41	ZZZZZZ	25	
14:46	ZZZZZZ	5	
		Element:	F e

6.2.1

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REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52207

Time	Sample Description	Element: Dilution	A F S e
14:51	ZZZZZZ	10	
14:56	ZZZZZZ	5	
15:01	ZZZZZZ	5	
15:06	ZZZZZZ	5	
15:11	MA52207-CCV6	1	X X
15:16	MA52207-CCB7	1	X X
15:21	ZZZZZZ	5	
15:26	ZZZZZZ	5	
15:31	ZZZZZZ	5	
15:36	ZZZZZZ	25	
15:41	MP32197-S1	5	
15:46	MP32197-S2	5	
15:51	ZZZZZZ	25	
15:56	ZZZZZZ	5	
16:01	ZZZZZZ	1	
16:06	MA52207-CCV7	1	X X
16:11	MA52207-CCB8	1	X X
16:16	ZZZZZZ	2	
16:21	ZZZZZZ	5	
16:26	ZZZZZZ	2	
16:31	ZZZZZZ	5	
16:36	ZZZZZZ	1	
16:41	ZZZZZZ	5	
16:46	ZZZZZZ	5	
16:51	ZZZZZZ	5	
16:56	ZZZZZZ	5	
17:01	ZZZZZZ	5	
17:06	MA52207-CCV8	1	X X
17:11	MA52207-CCB9	1	X X
17:16	ZZZZZZ	2	
17:21	ZZZZZZ	2	
17:26	ZZZZZZ	1	
17:31	ZZZZZZ	1	
		Element:	A F S e

6.2.1  
6

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:58	MA52207-STD1	4232 R	247840 R	22303 R	10823 R
09:03	MA52207-STD2	4034	235420	21926	9638
09:08	MA52207-ICV1	4128	237160	22170	9959
09:16	MA52207-ICB1	4250	245850	22237	10831
09:21	MA52207-CRI1	No results reported for the elements associated with this internal standard.			
09:27	MA52207-ICCV1	4142	239930	22489	9954
09:35	MA52207-CCB1	4259	247620	22420	10832
09:40	MA52207-CRI2	4226	245820	22430	10629
09:45	MA52207-CRID1	4260	249120	22568	10800
09:50	MA52207-ICSA1	3880	221700	22080	8926
09:55	MA52207-ICSAB1	3865	220310	21853	8917
10:00	MA52207-HSTD1	4170	246740	22505	10545
10:06	MA52207-HSTD2	3912	225510	21922	8976
10:11	ZZZZZZ	4261	248750	22591	10933
10:16	ZZZZZZ	4248	251660	22761	10938
10:21	ZZZZZZ	4349	252320	22882	11054
10:27	MA52207-CCV1	4139	238270	22297	9904
10:31	MA52207-CCB2	4276	248580	22392	10814
10:37	MP32224-MB1	4304	251950	23063	10895
10:42	MP32224-B1	4179	244490	22582	10174
10:47	MP32224-S1	4216	241450	23685	10112
10:52	MP32224-S2	4289	248250	23792	10104
10:57	JD42497-24	4355	251860	24156	10370
11:02	MP32224-SD1	4296	249050	22849	10576
11:07	MP32224-PS1	4240	244770	23744	10112
11:12	JD42497-22	4259	243890	24072	9810
11:17	JD42497-23	4405	254410	24225	10249
11:22	MA52207-CCV2	4138	240540	22128	9947
11:27	MA52207-CCB3	4254	250160	22514	10793
11:32	JD42497-26	4343	249470	24027	9980
11:37	JD42497-27	4324	247170	24476	9543
11:42	JD42497-29	4289	247450	24302	10250
11:47	JD42497-30	4532	259360	24980	10091

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
11:52	ZZZZZZ	4300	246030	24311	9663
11:58	ZZZZZZ	4262	232390	24311	9339
12:03	ZZZZZZ	4359	247420	23726	10305
12:08	ZZZZZZ	3903	230200	22044	9417
12:13	ZZZZZZ	4542	258590	24592	10374
12:18	MA52207-CCV3	4147	238700	22507	9949
12:23	MA52207-CCB4	4275	251960	22756	10827
12:28	ZZZZZZ	4496	255160	24491	10360
12:34	ZZZZZZ	4429	255460	24140	10451
12:39	MP32222-B1	4168	244930	22890	10159
12:43	MP32222-MB1	4249	248220	22481	10784
12:49	ZZZZZZ	4253	250740	23025	10803
12:54	MP32223-MB1	4230	246900	22531	10777
12:59	MP32223-B1	4273	246770	23424	10449
13:04	ZZZZZZ	4306	251610	22932	11033
13:09	ZZZZZZ	4229	245850	22375	10768
13:15	MA52207-CCV4	4131	240700	22633	9968
13:20	MA52207-CCB5	4232	248000	22398	10768
13:25	ZZZZZZ	4234	246630	22384	10748
13:30	JD40449-12R	4068	241740	22604	10015
13:35	MP32197-SD1	4204	244370	22593	10533
13:40	ZZZZZZ	4100	239770	22253	10146
13:45	ZZZZZZ	4088	239320	22291	10058
13:51	ZZZZZZ	4154	240440	22220	10269
13:56	ZZZZZZ	4085	241960	22476	10091
14:01	ZZZZZZ	4143	245800	22528	10383
14:06	ZZZZZZ	4112	243410	22363	10269
14:11	ZZZZZZ	4238	247430	22476	10799
14:16	MA52207-CCV5	4105	240020	22137	9957
14:21	MA52207-CCB6	4219	246420	22436	10793
14:26	MA52207-CRI3	4162	244540	22309	10564
14:31	MA52207-ICSA2	3811	221300	21810	8926
14:36	MA52207-ICSAB2	3805	221030	21769	8926

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
14:41	ZZZZZZ	4084	243290	22051	10269
14:46	ZZZZZZ	4005	238380	21889	9924
14:51	ZZZZZZ	4028	240820	22085	10075
14:56	ZZZZZZ	3991	239670	22085	9977
15:01	ZZZZZZ	4016	240000	22025	10086
15:06	ZZZZZZ	4016	240240	21939	10093
15:11	MA52207-CCV6	4063	240320	22189	9964
15:16	MA52207-CCB7	4178	249130	22242	10812
15:21	ZZZZZZ	4126	247650	22337	10512
15:26	ZZZZZZ	4040	239050	21987	10087
15:31	ZZZZZZ	4064	242530	22273	10221
15:36	ZZZZZZ	4127	242770	22172	10304
15:41	MP32197-S1	4019	239600	22131	10006
15:46	MP32197-S2	4004	238230	22102	9967
15:51	ZZZZZZ	4108	242540	21979	10325
15:56	ZZZZZZ	4077	243110	22238	10272
16:01	ZZZZZZ	4214	250970	22694	10910
16:06	MA52207-CCV7	4072	240540	22263	9971
16:11	MA52207-CCB8	4191	249990	22403	10833
16:16	ZZZZZZ	4260	249420	23312	10540
16:21	ZZZZZZ	4170	246260	22661	10508
16:26	ZZZZZZ	4255	249140	23239	10489
16:31	ZZZZZZ	4239	251590	22923	10655
16:36	ZZZZZZ	4201	250160	22836	10866
16:41	ZZZZZZ	4204	247970	22781	10504
16:46	ZZZZZZ	4207	246470	22790	10517
16:51	ZZZZZZ	4211	248700	22718	10530
16:56	ZZZZZZ	4203	248970	22744	10497
17:01	ZZZZZZ	4164	246240	22742	10381
17:06	MA52207-CCV8	4094	242340	22523	9998
17:11	MA52207-CCB9	4216	250420	22711	10861
17:16	ZZZZZZ	4292	249820	23646	10266
17:21	ZZZZZZ	4310	248410	24037	10033

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			09:16 ICB1		09:35 CCB1		10:31 CCB2		11:27 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	-0.800	<3.0	-0.900	<3.0	0.500	<3.0	-0.300	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1	anr							
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	-10.3	<100	-6.70	<100	-4.50	<100	-0.200	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3	anr							
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

6.2.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52207 Units: ug/l

Time: Sample ID:			12:23 CCB4		13:20 CCB5		14:21 CCB6		15:16 CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.600	<3.0	0.200	<3.0	-0.200	<3.0	0.00	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1	anr							
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	-2.70	<100	-6.10	<100	-6.10	<100	-5.20	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3	anr							
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

6.2.3  
6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

QC Batch ID: NP32224  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/09/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	2.6	8		
Antimony	2.0	.22	.41		
Arsenic	2.0	.13	.28	0.0099	<2.0
Barium	20	.099	1.9		
Beryllium	0.20	.02	.079		
Bismuth	2.0	.21	.51		
Boron	9.9	.099	3.7		
Cadmium	0.50	.02	.069		
Calcium	500	.76	21		
Chromium	0.99	.05	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.67	.83		
Iron	50	1.4	19	3.3	<50
Lead	2.0	.16	.41		
Lithium	5.0	.37	.91		
Magnesium	500	5.3	14		
Manganese	1.5	.0099	.41		
Molybdenum	2.0	.05	.32		
Nickel	4.0	.03	.35		
Phosphorus	20	.18	3.2		
Potassium	990	7.6	31		
Selenium	2.0	.2	.64		
Silicon	20	.13	11		
Silver	0.50	.089	.17		
Sodium	990	2.3	77		
Strontium	5.0	.04	.18		
Sulfur	9.9	.41	3.8		
Thallium	0.99	.16	.57		
Tin	20	.089	3.8		
Titanium	0.99	.089	.34		
Tungsten	5.0	.2	1.7		
Vanadium	5.0	.079	.19		
Zinc	15	.02	2.3		

No impact

6.9.1  
6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check:

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SD041122M1.ICP  
QC Limits: to % Recovery

Date Analyzed: 04/11/22  
Run ID: MA52207

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:	09:27		
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1960	98.0
Barium	anr		
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40000	100.0
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.2.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:	09:08	10:27	11:22
Sample ID:	ICV	CCV	CCV
Metal	True	Results	Results
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1970	98.5
Barium	anr		
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	39900	99.8
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.2.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:		12:18		13:15		14:16			
Sample ID: CCV		CCV3		CCV4		CCV5			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1950	97.5	2000	1960	98.0	2000	1960	98.0
Barium	anr								
Beryllium	anr								
Bismuth									
Boron	anr								
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	39500	98.8	40000	39700	99.3	40000	39300	98.3
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon	anr								
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

6.2.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SP041122M1.1CP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52207      Units: ug/l

Time:	15:11
Sample ID:	CCV
Metal	True
	CCV6
	Results % Rec

Aluminum	anr		
Antimony	anr		
Arsenic	2000	1960	98.0 ✓
Barium	anr		
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	39300	98.3 ✓
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.2.5  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNCCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.1CP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52207 Units: ug/l

Time:	10:00	10:06
Sample ID:	HSTD1	HSTD2
Metal	True	True
	Results	Results
	% Rec	% Rec

Aluminum					
Antimony	anr				
Arsenic	8000	7490	93.6		
Barium	anr				
Beryllium	anr				
Bismuth					
Boron	anr				
Cadmium	anr				
Calcium					
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron		200000	195000	97.5	
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon	anr				
Silver	anr				
Sodium					
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

6.2.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP Date Analyzed: 04/11/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52207 Units: ug/l

Time:	Sample ID:	CRI	CRIA	CRID	09:40 CRI2	09:45 CRID1	14:26 CR13	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results
Aluminum	200	500	100	anr				
Antimony	6.0	20	3.0	anr				
Arsenic	8.0	20	3.0	8.80	110.0	2.40	80.0	8.40 105.0 ✓
Barium	200		4.0	anr				
Beryllium	2.0		1.0	anr				
Bismuth	20							
Boron	100		10	anr				
Cadmium	3.0		1.0	anr				
Calcium	5000	2000	1000	anr				
Cerium								
Chromium	10		2.0	anr				
Cobalt	50		3.0	anr				
Copper	10		2.0	anr				
Iron	100	500		92.4	92.4		94.6	94.6 ✓
Lead	3.0	20	2.5	anr				
Lithium	50							
Magnesium	5000	2000	100	anr				
Manganese	15		3.0	anr				
Molybdenum	20							
Nickel	10		4.0	anr				
Phosphorus	50							
Potassium	5000		2000	anr				
Selenium	10	20	5.0	anr				
Silicon	200			anr				
Silver	5.0		2.0	anr				
Sodium	5000		1000	anr				
Strontium	10							
Sulfur	50							
Thallium	10		2.0	anr				
Tin	10							
Titanium	10							
Tungsten	50							
Vanadium	50		2.0	anr				

6.2.7 6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD041122M1.ICP      Date Analyzed: 04/11/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52207      Units: ug/l

Time:	Sample ID:	ICSA	ICSAB	09:50 ICSA1	09:55 ICSAB1	14:31 ICSA2	14:36 ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	484000	96.8	489000	97.8	484000	96.8
Antimony		1000	5.00		1010	101.0	1.40	1010
Arsenic		1000	2.50		1000	100.0	0.600	1010
Barium		500	-44.2		440	88.0	-44.3	447
Beryllium		500	0.100		475	95.0	0.00	484
Bismuth		500	11.4		487	97.4	7.80	487
Boron		500	-8.30		470	94.0	-7.20	469
Cadmium		1000	1.50		986	98.6	2.40	1010
Calcium	400000	400000	364000	91.0	382000	95.5	376000	94.0
Cerium			40.8		522*		43.4	533*
Chromium		500	1.60		470	94.0	1.60	469
Cobalt		500	2.30		470	94.0	2.40	468
Copper		500	-0.200		494	98.8	-1.60	495
Iron	200000	200000	190000	95.0	199000	99.5	189000	94.5
Lead		1000	-1.20		932	93.2	0.300	920
Lithium		500	-6.60		536	107.2	-4.20	542
Magnesium	500000	500000	485000	97.0	487000	97.4	491000	98.2
Manganese		500	1.30		498	99.6	1.20	506
Molybdenum		500	-3.10		464	92.8	-2.10	467
Nickel		1000	4.10		934	93.4	4.50	920
Phosphorus		500	13.7		481	96.2	6.60	481
Potassium			-42.6		-70.2		-200	-168
Selenium		1000	1.40		921	92.1	-1.00	928
Silicon		500	-21.5		494	98.8	-19.4	492
Silver		1000	2.80		1080	108.0	0.00	1080
Sodium			-84.8		-85.3		-116	-122
Strontium		500	1.20		483	96.6	1.20	488
Sulfur		500	-32.6		452	90.4	-34.8	451
Thallium		1000	-6.40		934	93.4	-5.50	930
Tin		500	-8.30		452	90.4	-8.00	455
Titanium		500	-1.00		479	95.8	-1.00	480
Tungsten		500	-1.50		477	95.4	-1.80	484
Vanadium		500	-4.40		469	93.8	-3.40	470

6.2.8  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date:

04/09/22

Metal	JD42497-24 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	21.1	246	238	94.7 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	37200	51200	2970	471.5(a) 75-125 74x
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/09/22

Metal	JD42497-24 Original MSD	Spikelet MPSFK2	% Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	21.1	208	238	78.7	16.7
Barium	anr				20
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	37200	31400	2970	-195.3 (a) 47.9 (b)	20
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

>4x

6.9.2  
6

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/09/22

Metal	BSP Result	Spikelet MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	191	198	96.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2500	2480	101.0	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/09/22

JD42497-24		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum	anr		
Antimony	anr		
Arsenic	178	170	4.5 0-10
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	314000	322000	2.6 0-10
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		

6.9.4  
6

# POST DIGESTATE SPIKE SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MF32224  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/09/22

Metal	Sample ml	Final ml	JD42497-24 Raw	PS Corr.*4 ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum									
Antimony									
Arsenic	19.25	20	177.5	170.8438 2331	0.2	200	2000	108.0	80-120
Barium									
Beryllium									
Bismuth									
Boron									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Phosphorus									
Potassium									
Selenium									
Silicon									
Silver									
Sodium									
Strontium									
Sulfur									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									
Zinc									

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:36	MA52215-STD1	1		STDA
06:41	MA52215-STD2	1		STDB
06:46	MA52215-ICV1	1		
06:54	MA52215-ICB1	1		
07:07	MA52215-ICCV1	1		
07:56	MA52215-CCB1	1		
08:00	MA52215-CRID1	1		
08:06	MA52215-CRI1	1		
08:10	MA52215-ICSA1	1		
08:16	MA52215-ICSAB1	1		
08:21	MA52215-HSTD1	1		
08:26	MA52215-HSTD2	1		
08:32	ZZZZZZ	1		
08:37	ZZZZZZ	1		
08:42	ZZZZZZ	1		
08:47	MA52215-CCV1	1		
08:51	MA52215-CCB2	1		
08:56	ZZZZZZ	1		
09:01	ZZZZZZ	1		
09:06	MP32224-S1	5		
09:11	MP32224-S2	5		
09:15	JD42497-24	5		
09:20	MP32224-SD1	25		
09:25	MP32224-PS1	5		
09:30	JD42497-26	2		
09:35	MA52215-CCV2	1		
09:40	MA52215-CCB3	1		
09:45	JD42497-27	20		As
09:50	JD42497-29	5		
09:54	JD42497-30	10		As
09:59	ZZZZZZ	5		
10:04	ZZZZZZ	5		
10:09	MP32230-B1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:14	MP32230-MB1	1		
10:19	MP32230-S1	1		
10:24	MP32230-S2	1		
10:28	MA52215-CCV3	1		
10:33	MA52215-CCB4	1		
10:38	MA52215-CRI2	1		
10:43	JD42431-4	1		(sample used for QC only; not part of login JD42497)
10:48	MP32230-SD1	5		
10:53	ZZZZZZ	1		
10:58	ZZZZZZ	1		
11:03	ZZZZZZ	1		
11:08	ZZZZZZ	1		
11:13	ZZZZZZ	1		
11:18	ZZZZZZ	1		
11:23	MA52215-CCV4	1		
11:28	MA52215-CCB5	1		
11:33	MA52215-ICSA2	1		
11:38	MA52215-ICSAB2	1		
11:43	ZZZZZZ	1		
11:48	ZZZZZZ	25		
11:53	ZZZZZZ	1		
11:58	ZZZZZZ	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	20		
12:13	ZZZZZZ	5		
12:18	MA52215-CCV5	1		
12:23	MA52215-CCB6	1		
12:28	MP32222-S1	2		
12:33	MP32222-S2	2		
12:38	JD42623-2A	2		(sample used for QC only; not part of login JD42497)
12:43	MP32222-SD1	10		
12:49	MP32222-S1	25		
12:54	MP32222-S2	25		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52215  
Parameters: As,Fe

Time	Sample Description	Dilution PS Factor	Recov	Comments
12:59	JD42623-2A	25		(sample used for QC only; not part of login JD42497)
13:04	MP32222-SD1	125		
13:09	ZZZZZZ	50		
13:14	MA52215-CCV6	1		
13:19	MA52215-CCB7	1		
13:24	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:34	ZZZZZZ	1		
13:39	ZZZZZZ	1		
13:44	ZZZZZZ	1		
13:49	MP32248-MB1	1		
13:54	MP32248-B1	1		
----->	Last reportable sample/prep for job JD42497			
13:59	JD42748-1	1		(sample used for QC only; not part of login JD42497)
14:04	MA52215-CCV7	1		
14:09	MA52215-CCB8	1		
----->	Last reportable CCB for job JD42497			
	Refer to raw data for calibration curve and standards.			

6.3

6

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Element: Dilution	As	Fe
06:46	MA52215-ICV1	1	X	X
06:54	MA52215-ICB1	1	X	X
07:07	MA52215-ICCV1	1	X	X
07:56	MA52215-CCB1	1	X	X
08:00	MA52215-CRID1	1	X	X
08:06	MA52215-CRI1	1	X	X
08:10	MA52215-ICSA1	1	X	X
08:16	MA52215-ICSAB1	1	X	X
08:21	MA52215-HSTD1	1	X	X
08:26	MA52215-HSTD2	1	X	X
08:32	ZZZZZZ	1		
08:37	ZZZZZZ	1		
08:42	ZZZZZZ	1		
08:47	MA52215-CCV1	1	X	X
08:51	MA52215-CCB2	1	X	X
08:56	ZZZZZZ	1		
09:01	ZZZZZZ	1		
09:06	MP32224-S1	5	X	X
09:11	MP32224-S2	5	X	X
09:15	JD42497-24	5	X	X
09:20	MP32224-SD1	25	X	X
09:25	MP32224-PS1	5	X	
09:30	JD42497-26	2	X	X
09:35	MA52215-CCV2	1	X	X
09:40	MA52215-CCB3	1	X	X
09:45	JD42497-27	20	X	
09:50	JD42497-29	5	X	X
09:54	JD42497-30	10	X	
09:59	ZZZZZZ	5		
10:04	ZZZZZZ	5		
10:09	MP32230-B1	1	X	X
10:14	MP32230-MB1	1	X	X
10:19	MP32230-S1	1	X	X
		Element:	As	Fe



REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52215

Time	Sample Description	Element: Dilution	F e
10:24	MP32230-S2	1	X X
10:28	MA52215-CCV3	1	X X
10:33	MA52215-CCB4	1	X X
10:38	MA52215-CRI2	1	X X
10:43	JD42431-4	1	(a)
10:48	MP32230-SD1	5	X X
10:53	ZZZZZZ	1	
10:58	ZZZZZZ	1	
11:03	ZZZZZZ	1	
11:08	ZZZZZZ	1	
11:13	ZZZZZZ	1	
11:18	ZZZZZZ	1	
11:23	MA52215-CCV4	1	X X
11:28	MA52215-CCB5	1	X X
11:33	MA52215-ICSA2	1	X X
11:38	MA52215-ICSAB2	1	X X
11:43	ZZZZZZ	1	
11:48	ZZZZZZ	25	
11:53	ZZZZZZ	1	
11:58	ZZZZZZ	1	
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	20	
12:13	ZZZZZZ	5	
12:18	MA52215-CCV5	1	X X
12:23	MA52215-CCB6	1	X X
12:28	MP32222-S1	2	X
12:33	MP32222-S2	2	X
12:38	JD42623-2A	2	(a)
12:43	MP32222-SD1	10	X
12:49	MP32222-S1	25	
12:54	MP32222-S2	25	
12:59	JD42623-2A	25	(a)
13:04	MP32222-SD1	125	
		Element: Dilution	F e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52215  
 Parameters: As, Fe

Time	Sample Description	Element: A F Dilution S e
13:03	ZZZZZZ	50
13:14	MA52215-CCV6	1 X X
13:19	MA52215-CCB7	1 X X
13:24	ZZZZZZ	1
13:29	ZZZZZZ	1
13:34	ZZZZZZ	1
13:39	ZZZZZZ	1
13:44	ZZZZZZ	1
13:49	MP32248-MB1	1
13:54	MP32248-B1	1
13:59	JD42748-1	1 (a)
14:04	MA52215-CCV7	1 X X
14:09	MA52215-CCB8	1 X X

(a) Sample used for QC only; not part of login JD42497.

Element: A F  
 S e

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:36	MA52215-STD1	6357 R	198520 R	20417 R	10988 R
06:41	MA52215-STD2	6060	185260	20705	9777
06:46	MA52215-ICV1	6263	191380	20927	10188
06:54	MA52215-ICB1	6465	201510	20911	11166
07:07	MA52215-ICCV1	6262	192150	20950	10224
07:56	MA52215-CCB1	6474	202330	21021	11210
08:00	MA52215-CRID1	6455	201650	20920	11159
08:06	MA52215-CRI1	6435	200340	20980	10998
08:10	MA52215-ICSA1	5845	176930	20612	9151
08:16	MA52215-ICSAB1	5855	177300	20692	9167
08:21	MA52215-HSTD1	6330	195490	20946	10950
08:26	MA52215-HSTD2	5884	179730	20648	9149
08:32	ZZZZZZ	6295	197000	20922	11045
08:37	ZZZZZZ	6309	200560	20880	11185
08:42	ZZZZZZ	6433	199920	20800	11212
08:47	MA52215-CCV1	6308	192990	20999	10268
08:51	MA52215-CCB2	6484	202680	21087	11198
08:56	ZZZZZZ	6513	203140	21065	11257
09:01	ZZZZZZ	6408	197490	21203	10598
09:06	MP32224-S1	6548	200540	21406	10891
09:11	MP32224-S2	6517	199890	21182	10881
09:15	JD42497-24	6579	202240	21526	11028 ✓
09:20	MP32224-SD1	6539	203070	21228	11171
09:25	MP32224-PS1	6549	200700	21464	10863
09:30	JD42497-26	6522	200830	21929	10530 ✓
09:35	MA52215-CCV2	6331	194260	21122	10314
09:40	MA52215-CCB3	6535	203630	20965	11281
09:45	JD42497-27	6573	203170	21197	11073 ✓
09:50	JD42497-29	6514	201360	21291	10890 ✓
09:54	JD42497-30	6597	202890	21373	11057 ✓
09:59	ZZZZZZ	6492	199830	21303	10680
10:04	ZZZZZZ	6450	199900	21426	10431
10:09	MP32230-B1	6223	190410	20638	10376

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:14	MP32230-MB1	6362	197770	20585	11109
10:19	MP32230-S1	6142	187450	20583	9979
10:24	MP32230-S2	6086	186390	20567	9926
10:28	MA52215-CCV3	6344	194710	21160	10335
10:33	MA52215-CCB4	6571	205010	21241	11318
10:38	MA52215-CRI2	6526	202500	21003	11117
10:43	JD42431-4	6105	189350	20367	10288
10:48	MP32230-SD1	6464	201610	21170	11058
10:53	ZZZZZZ	6138	189870	20450	10302
10:58	ZZZZZZ	6225	193280	20770	10520
11:03	ZZZZZZ	6268	193000	20620	10597
11:08	ZZZZZZ	5864	179650	20435	9319
11:13	ZZZZZZ	5683	174070	20087	8889
11:18	ZZZZZZ	6104	187610	20432	9978
11:23	MA52215-CCV4	6371	195080	21069	10343
11:28	MA52215-CCB5	6557	203580	20975	11267
11:33	MA52215-ICSA2	5907	178650	20606	9189
11:38	MA52215-ICSAB2	5914	179260	20635	9224
11:43	ZZZZZZ	6233	191720	20381	10377
11:48	ZZZZZZ	6349	198190	20778	10612
11:53	ZZZZZZ	6574	204460	21011	11298
11:58	ZZZZZZ	6419	195440	22320	9522
12:03	ZZZZZZ	6424	199130	20479	11198
12:08	ZZZZZZ	6385	196390	20835	10527
12:13	ZZZZZZ	6491	199920	21316	10476
12:18	MA52215-CCV5	6382	194610	20932	10369
12:23	MA52215-CCB6	6564	204740	20968	11306
12:28	MP32222-S1	5162	160320	19778	7889
12:33	MP32222-S2	5149	160640	19766	7870
12:38	JD42623-2A	5156	159780	19788	7922
12:43	MP32222-SD1	5876	182190	20515	9290
12:49	MP32222-S1	6178	191440	20705	9999
12:54	MP32222-S2	6107	189400	20386	9930

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:59	JD42623-2A	6090	189220	20239	9909
13:04	MP32222-SD1	6413	198930	20597	10788
13:09	ZZZZZZ	6303	194850	20469	10386
13:14	MA52215-CCV6	6356	195300	20648	10316
13:19	MA52215-CCB7	6586	204940	20802	11309
13:24	ZZZZZZ	6463	198640	21159	10636
13:29	ZZZZZZ	6628	207750	21123	11387
13:34	ZZZZZZ	6612	205290	20847	11292
13:39	ZZZZZZ	6625	204130	20820	11299
13:44	ZZZZZZ	6603	206760	20502	11382
13:49	MP32248-MB1	6621	208210	21028	11374
13:54	MP32248-B1	6486	199770	20874	10662
13:59	JD42748-1	6419	198960	21890	9794
14:04	MA52215-CCV7	6441	194790	20567	10414
14:09	MA52215-CCB8	6567	205690	20618	11258

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

6.3.2

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			06:54 ICB1		07:56 CCB1		08:51 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	-0.100	<3.0	0.00	<3.0	-0.200	<3.0	-0.600	<3.0
Barium	200	.8								
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3	anr							
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4								
Copper	10	.8	anr							
Iron	100	5.3	-0.300	<100	-2.90	<100	5.00	<100	-2.40	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

6.3.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			10:33 CCB4	11:28 CCB5	12:23 CCB6	13:19 CCB7		
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	17	anr					
Antimony	6.0	1.7	anr					
Arsenic	3.0	2.1	0.100	<3.0	0.600	<3.0	0.500	<3.0
Barium	200	.8						
Beryllium	1.0	.3	anr					
Bismuth	20	2.3						
Boron	100	2.3	anr					
Cadmium	3.0	.3	anr					
Calcium	5000	6.6	anr					
Cerium	100							
Chromium	10	.3	anr					
Cobalt	50	.4						
Copper	10	.8	anr					
Iron	100	5.3	2.30	<100	4.00	<100	5.70	<100
Lead	3.0	1.1	anr					
Lithium	50	4.8						
Magnesium	5000	32						
Manganese	15	.1	anr					
Molybdenum	20	.6						
Nickel	10	.4	anr					
Phosphorus	50	1.2						
Potassium	10000	77	anr					
Selenium	10	3.2	anr					
Silicon	200	1.7						
Silver	10	1	anr					
Sodium	10000	34	anr					
Strontium	10	.3						
Sulfur	50	3	anr					
Thallium	10	1.8	anr					
Tin	10	.8						
Titanium	10	.5						
Tungsten	50	2.6						
Vanadium	50	.6						

No impact

6.3.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222MI.ICP  
QC Limits: result < RL

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:			14:09	
Sample ID:			CCB8	
Metal	RL	IDL	raw	final
Aluminum	200	17	anr	
Antimony	6.0	1.7	anr	
Arsenic	3.0	2.1	0.200	<3.0 ✓
Barium	200	.8		
Beryllium	1.0	.3	anr	
Bismuth	20	2.3		
Boron	100	2.3	anr	
Cadmium	3.0	.3	anr	
Calcium	5000	6.6	anr	
Cerium	100			
Chromium	10	.3	anr	
Cobalt	50	.4		
Copper	10	.8	anr	
Iron	100	5.3	5.70	<100
Lead	3.0	1.1	anr	
Lithium	50	4.8		
Magnesium	5000	32		
Manganese	15	.1	anr	
Molybdenum	20	.6		
Nickel	10	.4	anr	
Phosphorus	50	1.2		
Potassium	10000	77	anr	
Selenium	10	3.2	anr	
Silicon	200	1.7		
Silver	10	1	anr	
Sodium	10000	34	anr	
Strontium	10	.3		
Sulfur	50	3	anr	
Thallium	10	1.8	anr	
Tin	10	.8		
Titanium	10	.5		
Tungsten	50	2.6		
Vanadium	50	.6		

No impact

No impact

6.3.3

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52215      Units: ug/l

Time:	07:07
Sample ID:	ICCV
Metal	True
	Results % Rec

Aluminum	anr		
Antimony	anr		
Arsenic	2000	1950	97.5 ✓
Barium			
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt			
Copper	anr		
Iron	40000	39900	99.8 ✓
Lead	anr		
Lithium			
Magnesium			
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium			

6.3.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time:		06:46			08:47			09:35		
Sample ID: ICV		ICV1	CCV		CCV1	CCV		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Aluminum	anr									
Antimony	anr									
Arsenic	2000	1960	98.0	2000	1970	98.5	2000	1950	97.5	✓
Barium										
Beryllium	anr									
Bismuth										
Boron	anr									
Cadmium	anr									
Calcium	anr									
Cerium										
Chromium	anr									
Cobalt										
Copper	anr									
Iron	40000	39900	99.8	40000	39500	98.8	40000	37600	94.0	✓
Lead	anr									
Lithium										
Magnesium										
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur	anr									
Thallium	anr									
Tin										
Titanium										
Tungsten										
Vanadium										

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52215      Units: ug/l

Time:	10:28	11:23	12:18
Sample ID:	CCV3	CCV4	CCV5
Metal	True	True	True
	Results	Results	Results
	% Rec	% Rec	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000    1930    96.5	2000    1930    96.5	2000    1940    97.0
Barium			
Beryllium	anr		
Bismuth			
Boron	anr		
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt			
Copper	anr		
Iron	40000    37500    93.8	40000    37800    94.5	40000    38100    95.3
Lead	anr		
Lithium			
Magnesium			
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium			

6.3.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Heck, PA

File ID: SC041222M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 04/12/22  
Run ID: MA52215

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		13:14		14:04	
Sample ID:		CCV6		CCV7	
Metal	CCV	Results	% Rec	Results	% Rec
Aluminum	anr				
Antimony	anr				
Arsenic	2000	1910	95.5	2000	1890 94.5 ✓
Barium					
Beryllium	anr				
Bismuth					
Boron	anr				
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron	40000	37500	93.8	40000	37400 93.5 ✓
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium					

6.3.5  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52215 Units: ug/l

Time:	08:21	08:26
Sample ID:	HSTD1	HSTD2
Metal	True	Results % Rec

Aluminum					
Antimony	anr				
Arsenic	8000	7430	92.9		
Barium					
Beryllium	anr				
Bismuth					
Boron	anr				
Cadmium	anr				
Calcium					
Cerium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron		200000	189000	94.5	
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium					

6.3.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP Date Analyzed: 04/12/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52215 Units: ug/l

Time:	CRI	CRIA	CRID	08:00		08:06		10:38	
Sample ID:	CRI	CRIA	CRID	CRID1		CRI1		CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	3.10	103.3	7.30	91.3	7.90	98.8
Barium	200		4.0						
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				106	106.0	101	101.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

6.3.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHEPAFW: Marcus Hook, PA

File ID: SC041222M1.ICP      Date Analyzed: 04/12/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52215      Units: ug/l

Time:	Sample ID:	ICSA	ICSAB	08:10	08:16	11:33	11:38	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	488000	97.6	490000	98.0	480000	96.0
Antimony		1000	-1.80		959	95.9	0.100	
Arsenic		1000	-0.600		962	96.2	0.500	
Barium		500	6.20		470	94.0	6.20	
Beryllium		500	0.100		461	92.2	0.100	
Bismuth		500	-10.3		434	86.8	-11.2	
Boron		500	1.10		455	91.0	1.80	
Cadmium		1000	0.500		973	97.3	0.400	
Calcium	400000	400000	370000	92.5	375000	93.8	355000	88.8
Cerium			18.9		486*		17.5	
Chromium		500	-1.70		450	90.0	-1.80	
Cobalt		500	0.800		463	92.6	0.800	
Copper		500	-2.90		482	96.4	-3.20	
Iron	200000	200000	186000	93.0	194000	97.0	180000	90.0
Lead		1000	1.40		888	88.8	0.800	
Lithium		500	-8.50		533	106.6	-7.30	
Magnesium	500000	500000	484000	96.8	472000	94.4	470000	94.0
Manganese		500	0.900		482	96.4	0.700	
Molybdenum		500	-2.50		458	91.6	-2.10	
Nickel		1000	0.00		891	89.1	0.00	
Phosphorus		500	-5.60		447	89.4	-8.50	
Potassium			-536		-537		-554	
Selenium		1000	1.80		878	87.8	-1.70	
Silicon		500	5.60		504	100.8	9.80	
Silver		1000	4.30		1020	102.0	4.20	
Sodium			69.0		90.1		167	
Strontium		500	-0.900		468	93.6	-0.800	
Sulfur		500	-25.2		424	84.8	-24.0	
Thallium		1000	-4.50		879	87.9	-5.70	
Tin		500	-5.50		442	88.4	-5.90	
Titanium		500	-1.60		463	92.6	-1.50	
Tungsten		500	-2.40		470	94.0	-0.300	
Vanadium		500	-2.60		464	92.8	-1.90	

2.1

6.3.8

6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:01	MA52222-STD1	1		STDA
06:06	MA52222-STD2	1		STDB
06:11	MA52222-ICV1	1		
06:16	MA52222-ICB1	1		
06:23	MA52222-ICCV1	1		
06:36	MA52222-CCB1	1		
06:42	MA52222-CRID1	1		
06:48	MA52222-CRI1	1		
06:52	MA52222-ICSA1	1		
06:58	MA52222-ICSAB1	1		
07:03	MA52222-HSTD1	1		
07:08	MA52222-HSTD2	1		
07:14	ZZZZZZ	1		
07:19	ZZZZZZ	1		
07:24	MA52222-CRID2	1		
07:29	ZZZZZZ	1		
07:34	MA52222-CCV1	1		
07:38	MA52222-CCB2	1		
07:43	MP32248-MB1	1		
07:48	MP32248-B1	1		
07:53	MP32248-S1	1		Ca, FE high
07:58	MP32248-S2	1		Ca, FE high
08:03	JD42748-1	1		(sample used for QC only; not part of login JD42497)
08:08	MP32248-SD1	5		Ca, FE high
08:13	MP32248-PS1	1		
08:17	JD42497-25	1		
08:22	MA52222-CCV2	1		
08:29	MA52222-CCB3	1		
08:34	ZZZZZZ	1		
08:39	ZZZZZZ	1		
08:44	ZZZZZZ	1		
08:49	ZZZZZZ	1		
08:54	MP32253-B1	1		

-----> Last reportable sample/prep for job JD42497



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:58	ZZZZZZ	2		
09:03	ZZZZZZ	1		
09:09	MA52222-CCV3	1		
09:14	MA52222-CCB4	1		
09:21	MA52222-CRI2	1		
09:27	MA52222-ICSA2	1		
09:32	MA52222-ICSAB2	1		
09:38	MA52222-CCV4	1		
09:42	MA52222-CCB5	1		

-----> Last reportable CCB for job JD42497  
Refer to raw data for calibration curve and standards.

6.4

6

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52222

Time	Sample Description	Element: Dilution	Fe
06:11	MA52222-ICV1	1	X X
06:16	MA52222-ICB1	1	X X
06:23	MA52222-ICCV1	1	X X
06:36	MA52222-CCB1	1	X X
06:42	MA52222-CRID1	1	X X
06:48	MA52222-CRI1	1	X X
06:52	MA52222-ICSA1	1	X X
06:58	MA52222-ICSAB1	1	X X
07:03	MA52222-HSTD1	1	X X
07:08	MA52222-HSTD2	1	X X
07:14	ZZZZZZ	1	X X
07:19	ZZZZZZ	1	X X
07:24	MA52222-CRID2	1	X X
07:29	ZZZZZZ	1	X X
07:34	MA52222-CCV1	1	X X
07:38	MA52222-CCB2	1	X X
07:43	MP32248-MB1	1	X X
07:48	MP32248-B1	1	X X
07:53	MP32248-S1	1	X X
07:58	MP32248-S2	1	X X
08:03	JD42748-1	1	(a)
08:08	MP32248-SD1	5	X X
08:13	MP32248-PS1	1	X X
08:17	JD42497-25	1	X X
08:22	MA52222-CCV2	1	X X
08:29	MA52222-CCB3	1	X X
08:34	ZZZZZZ	1	X X
08:39	ZZZZZZ	1	X X
08:44	ZZZZZZ	1	X X
08:49	ZZZZZZ	1	X X
08:54	MP32253-B1	1	X X
08:58	ZZZZZZ	2	X X
09:03	ZZZZZZ	1	X X
		Element: Dilution	Fe

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
 Analyst: ND  
 Parameters: As, Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52222

Time	Sample Description	Element: Dilution	As	Fe
09:09	MA52222-CCV3	1	X	X
09:14	MA52222-CCB4	1	X	X
09:21	MA52222-CRI2	1	X	X
09:27	MA52222-ICSA2	1	X	X
09:32	MA52222-ICSAB2	1	X	X
09:38	MA52222-CCV4	1	X	X
09:42	MA52222-CCB5	1	X	X

(a) Sample used for QC only; not part of login JD42497.

Element:  
As Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:01	MA52222-STD1	6491 R	202350 R	20972 R	11389 R
06:06	MA52222-STD2	6122	187720	20802	10066
06:11	MA52222-ICV1	6277	193110	21144	10395
06:16	MA52222-ICB1	6470	202410	21128	11326
06:23	MA52222-ICCV1	6340	193160	21117	10512
06:36	MA52222-CCB1	6517	201890	21390	11456
06:42	MA52222-CRID1	No results reported for the elements associated with this internal standard.			
06:48	MA52222-CRI1	6478	202790	21333	11297
06:52	MA52222-ICSA1	5938	178350	21186	9456
06:58	MA52222-ICSAB1	5952	179630	21226	9498
07:03	MA52222-HSTD1	6440	200690	21665	11288
07:08	MA52222-HSTD2	6049	184640	21371	9551
07:14	ZZZZZZ	6423	197690	21257	11440
07:19	ZZZZZZ	6398	201110	21165	11504
07:24	MA52222-CRID2	6640	207050	21686	11627
07:29	ZZZZZZ	6512	203450	21334	11549
07:34	MA52222-CCV1	6532	201570	22167	10806
07:38	MA52222-CCB2	6736	211370	21848	11789
07:43	MP32248-MB1	6802	212310	22420	11901
07:48	MP32248-B1	6643	208130	22699	11157
07:53	MP32248-S1	6881	210480	23917	10727
07:58	MP32248-S2	6770	210110	23625	10715
08:03	JD42748-1	6629	204370	23501	10364
08:08	MP32248-SD1	6780	211240	22758	11263
08:13	MP32248-PS1	6559	203140	23223	10223
08:17	JD42497-25	6884	211820	23562	11245
08:22	MA52222-CCV2	6739	207080	22764	11090
08:29	MA52222-CCB3	6929	217110	22345	12070
08:34	ZZZZZZ	6823	216040	22725	11916
08:39	ZZZZZZ	6805	217510	23014	11916
08:44	ZZZZZZ	6905	207950	23645	11200
08:49	ZZZZZZ	6879	211670	23532	11317
08:54	MP32253-B1	6915	213630	23005	11479

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA





File ID: SC041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52222

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:58	ZZZZZZ	6980	215350	23288	11612
09:03	ZZZZZZ	6855	209060	22920	11807
09:09	MA52222-CCV3	6830	208750	22909	11125
09:14	MA52222-CCB4	7059	220170	22764	12199
09:21	MA52222-CRI2	6992	217380	22957	12038
09:27	MA52222-ICSA2	6380	195050	22705	10055
09:32	MA52222-ICSAB2	6390	195140	22795	10092
09:38	MA52222-CCV4	6849	212330	23213	11310
09:42	MA52222-CCB5	7068	221910	23032	12341

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 
Istd#2	Yttrium (3600)	70-130 
Istd#3	Yttrium (3710)	70-130 
Istd#4	Indium	70-130 

6.4.2

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			06:16 ICB1		06:36 CCB1		07:38 CCB2		08:29 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.00	<3.0	0.400	<3.0	-1.30	<3.0	-0.600	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	10.3	<100	11.7	<100	1.90	<100	0.300	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

No impact

6.4.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		09:14		09:42		
Sample ID:		CCB4		CCB5		
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	17	anr			
Antimony	6.0	1.7	anr			
Arsenic	3.0	2.1	0.100	<3.0	-0.500	<3.0
Barium	200	.8	anr			
Beryllium	1.0	.3	anr			
Bismuth	20	2.3				
Boron	100	2.3				
Cadmium	3.0	.3	anr			
Calcium	5000	6.6	anr			
Cerium	100					
Chromium	10	.3	anr			
Cobalt	50	.4	anr			
Copper	10	.8	anr			
Iron	100	5.3	4.10	<100	3.70	<100
Lead	3.0	1.1	anr			
Lithium	50	4.8				
Magnesium	5000	32	anr			
Manganese	15	.1	anr			
Molybdenum	20	.6				
Nickel	10	.4	anr			
Phosphorus	50	1.2				
Potassium	10000	77	anr			
Selenium	10	3.2	anr			
Silicon	200	1.7				
Silver	10	1	anr			
Sodium	10000	34	anr			
Strontium	10	.3				
Sulfur	50	3	anr			
Thallium	10	1.8	anr			
Tin	10	.8				
Titanium	10	.5				
Tungsten	50	2.6				
Vanadium	50	.6	anr			

6.4.3  
6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.7	8.1		
Antimony	2.0	.17	.41		
Arsenic	2.0	.21	.28	-0.020	<2.0 ✓
Barium	20	.08	1.9		
Beryllium	0.20	.03	.08		
Bismuth	2.0	.23	.52		
Boron	10	.23	3.7		
Cadmium	0.50	.03	.07		
Calcium	500	.66	21		
Chromium	1.0	.03	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.08	.84		
Iron	50	.53	19	3.1	<50
Lead	2.0	.11	.41		
Lithium	5.0	.48	.92		
Magnesium	500	3.2	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.06	.32		
Nickel	4.0	.04	.35		
Phosphorus	20	.12	3.3		
Potassium	1000	7.7	32		
Selenium	2.0	.32	.65		
Silicon	20	.17	11		
Silver	0.50	.1	.17		
Sodium	1000	3.4	78		
Strontium	5.0	.03	.18		
Sulfur	10	.3	3.9		
Thallium	1.0	.18	.58		
Tin	20	.08	3.8		
Titanium	1.0	.05	.34		
Tungsten	5.0	.26	1.8		
Vanadium	5.0	.06	.19		
Zinc	5.0	.01	2.3		

No impact

6.10.1  
6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPATW: Marcus Hook, PA

File ID: SC041322M1.ICF Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52222 Units: ug/l

Time: 06:23		06:23	
Sample ID: ICCV		ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1970	98.5 ✓
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40200	100.5 ✓
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.4.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52222      Units: ug/l

Time:		06:11		07:34		08:22			
Sample ID:		ICV1		CCV1		CCV2			
Metal	ICV	Results	% Rec	CCV	Results	% Rec	CCV	Results	% Rec
	True			True			True		
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2020	101.0	2000	1910	95.5	2000	1850	92.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Cerium									
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	40000	42500	106.3	40000	38200	95.5	40000	37200	93.0
Lead	anr								
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur	anr								
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								

90-110 ✓

6.4.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 04/13/22  
Run ID: MA52222

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		09:09			09:38		
Sample ID:		CCV	CCV3	CCV	CCV4	Results	% Rec
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum	anr						
Antimony	anr						
Arsenic	2000	1850	92.5	2000	1820	91.0	✓
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	39000	97.5	40000	36300	90.8	✓
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur	anr						
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

6.4.5  
6

## HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52222 Units: ug/l

Time:	07:03	07:08
Sample ID:	HSTD1	HSTD2
Metal	True	True
	Results	% Rec

Aluminum					
Antimony	anr				
Arsenic	8000	7630	95.4		✓
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron		200000	196000	98.0	✓
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver					
Sodium					
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

6.4.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52222 Units: ug/l

	Time: Sample ID:	CRI	CRIA	GRID	06:48 CRI1 Results	% Rec	07:24 GRID2 Results	% Rec	09:21 CRI2 Results	% Rec	
	Metal	True	True	True							
Aluminum	200	500		100	anr						
Antimony	6.0	20		3.0	anr						
Arsenic	8.0	20		3.0	7.80	97.5	2.40	80.0	6.40	80.0	✓
Barium	200			4.0	anr						
Beryllium	2.0			1.0	anr						
Bismuth	20										
Boron	100			10							
Cadmium	3.0			1.0	anr						
Calcium	5000	2000		1000	anr						
Cerium											
Chromium	10			2.0	anr						
Cobalt	50			3.0	anr						
Copper	10			2.0	anr						
Iron	100	500			111	111.0			98.1	98.1	✓
Lead	3.0	20		2.5	anr						
Lithium	50										
Magnesium	5000	2000		100	anr						
Manganese	15			3.0	anr						
Molybdenum	20										
Nickel	10			4.0	anr						
Phosphorus	50										
Potassium	5000			2000	anr						
Selenium	10	20		5.0	anr						
Silicon	200										
Silver	5.0			2.0	anr						
Sodium	5000			1000	anr						
Strontium	10										
Sulfur	50				anr						
Thallium	10			2.0	anr						
Tin	10										
Titanium	10										
Tungsten	50										
Vanadium	50			2.0	anr						

6.4.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52222      Units: ug/l

2.1

Time:	Sample ID:	ICSA	ICSAB	06:52		06:58		09:27		09:32	
Metal		True	True	ICSA1	% Rec	ICSAB1	% Rec	ICSA2	% Rec	ICSAB2	% Rec
Aluminum	500000	500000	505000	101.0		504000	100.8	466000	93.2	467000	93.4
Antimony		1000	-1.60			960	96.0	-2.60		892	89.2
Arsenic		1000	0.500			960	96.0	0.500		889	88.9
Barium		500	6.10			462	92.4	5.40		430	86.0
Beryllium		500	0.100			453	90.6	0.00		419	83.8
Bismuth		500	-9.40			458	91.6	-6.90		424	84.8
Boron		500	-0.500			452	90.4	0.500		419	83.8
Cadmium		1000	0.600			963	96.3	0.400		889	88.9
Calcium	400000	400000	378000	94.5		393000	98.3	353000	88.3	358000	89.5
Cerium			13.4			471*		14.6		430*	
Chromium		500	-1.70			445	89.0	-1.10		406	81.2
Cobalt		500	0.700			455	91.0	0.700		426	85.2
Copper		500	2.90			487	97.4	3.40		440	88.0
Iron	200000	200000	191000	95.5		201000	100.5	177000	88.5	186000	93.0
Lead		1000	0.200			882	88.2	-1.80		823	82.3
Lithium		500	-7.60			525	105.0	-7.10		485	97.0
Magnesium	500000	500000	498000	99.6		488000	97.6	458000	91.6	449000	89.8
Manganese		500	0.800			479	95.8	0.800		436	87.2
Molybdenum		500	-2.00			455	91.0	-1.80		421	84.2
Nickel		1000	0.300			877	87.7	0.200		822	82.2
Phosphorus		500	-9.60			444	88.8	-9.50		416	83.2
Potassium			-601			-616		-578		-568	
Selenium		1000	2.60			877	87.7	3.30		810	81.0
Silicon		500	6.60			504	100.8	6.10		470	94.0
Silver		1000	4.90			1030	103.0	4.40		932	93.2
Sodium			65.2			80.3		59.4		71.4	
Strontium		500	-1.20			457	91.4	-1.30		424	84.8
Sulfur		500	-24.9			428	85.6	-15.4		405	81.0
Thallium		1000	-6.20			868	86.8	-4.40		809	80.9
Tin		500	-4.70			440	88.0	-4.80		408	81.6
Titanium		500	-2.10			463	92.6	-1.70		423	84.6
Tungsten		500	-0.300			468	93.6	0.00		435	87.0
Vanadium		500	-3.90			460	92.0	-2.60		420	84.0

6.4.8  
6

## MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: HP32248  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date:

04/12/22

Metal	JD42748-1 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	3.1	185	223	81.4 75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	16900	28000	2790	300.7(a) 75-125
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

Batch QC

6.10.2  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MF32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 04/12/22

Metal	JD42748-1 Original MSD	Spikelot MFSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	3.1	180	228	77.6	2.7
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	16900	21800	2850	77.2	24.9 (a)
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				

Batch QC

6.10.2  
6



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MF32248  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 04/12/22

Metal	BSP Result	Spikelet MFSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	176	198	88.9	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2370	2480	95.7	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur	anr			
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32248  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

JD42748-1		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum	anr		
Antimony	anr		
Arsenic	25.9	31.2	20.5 (a) 0-10
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	172000	170000	9.4 0-10
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		

Batch QC

6.10.4  
 6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:27	MA52223-STD1	1		STDA
10:33	MA52223-STD2	1		STDB
10:37	MA52223-ICV1	1		
10:45	MA52223-ICB1	1		
10:53	MA52223-ICCV1	1		
11:00	MA52223-CCB1	1		
11:05	MA52223-CRID1	1		
11:10	MA52223-CRI1	1		
11:15	MA52223-ICSA1	1		
11:20	MA52223-ICSAB1	1		
11:25	MA52223-HSTD1	1		
11:30	MA52223-HSTD2	1		
11:35	MP32253-B1	1		
11:40	MP32253-MB1	1		
11:45	MP32253-S1	1		Ca, MN, Na high
11:50	MA52223-CCV1	1		
11:55	MA52223-CCB2	1		
12:00	MP32253-S2	1		Ca, MN, Na high
12:05	JD42841-1	1		(sample used for QC only; not part of login JD42497)
12:11	MP32253-SD1	5		Ca, MN, Na high
12:16	ZZZZZZ	1		
12:21	JD42497-28	1		
12:26	ZZZZZZ	1		
12:31	MA52223-CRI2	1		
12:37	ZZZZZZ	1		
12:42	ZZZZZZ	2		
12:47	MA52223-CCV2	1		
12:51	MA52223-CCB3	1		
12:57	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:07	MA52223-CRID2	1		
13:12	MA52223-ICSA2	1		
13:17	MA52223-ICSAB2	1		

EB

----->

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:22	MP32249-S1	2		
13:27	MP32249-S2	2		
13:32	DA43674-3	2		(sample used for QC only; not part of login JD42497)
13:36	MP32249-SD1	10		
13:42	MA52223-CCV3	1		
13:46	MA52223-CCB4	1		
----->	Last reportable CCB for job JD42497			
13:52	MP32284-B1	1		
13:56	MP32284-MB1	1		
14:01	MP32284-S1	1		
14:06	MP32284-S2	1		
14:11	JD42918-1	1		(sample used for QC only; not part of login JD42497)
14:16	MP32284-SD1	5		
14:22	ZZZZZZ	1		
14:27	ZZZZZZ	1		
14:32	MA52223-CCV4	1		
14:37	MA52223-CCB5	1		
14:42	ZZZZZZ	1		
14:47	ZZZZZZ	1		
14:52	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52223-CCV5	1		
15:13	MA52223-CCB6	1		
15:18	ZZZZZZ	1		
15:22	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Element: Dilution	F e
10:37	MA52223-ICV1	1	X X
10:45	MA52223-ICB1	1	X X
10:53	MA52223-ICCV1	1	X X
11:00	MA52223-CCB1	1	X X
11:05	MA52223-CRID1	1	X X
11:10	MA52223-CRI1	1	X X
11:15	MA52223-ICSA1	1	X X
11:20	MA52223-ICSAB1	1	X X
11:25	MA52223-HSTD1	1	X X
11:30	MA52223-HSTD2	1	X X
11:35	MP32253-B1	1	X X
11:40	MP32253-MB1	1	X X
11:45	MP32253-S1	1	X X
11:50	MA52223-CCV1	1	X X
11:55	MA52223-CCB2	1	X X
12:00	MP32253-S2	1	X X
12:05	JD42841-1	1	(a)
12:11	MP32253-SD1	5	X X
12:16	ZZZZZZ	1	
12:21	JD42497-28	1	X X
12:26	ZZZZZZ	1	
12:31	MA52223-CRI2	1	X X
12:37	ZZZZZZ	1	
12:42	ZZZZZZ	2	
12:47	MA52223-CCV2	1	X X
12:51	MA52223-CCB3	1	X X
12:57	ZZZZZZ	1	
13:02	ZZZZZZ	1	
13:07	MA52223-CRID2	1	X X
13:12	MA52223-ICSA2	1	X X
13:17	MA52223-ICSAB2	1	X X
13:22	MP32249-S1	2	
13:27	MP32249-S2	2	
		Element: Dilution	F e

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution	Element: As	Element: Fe
13:32	DA43674-3	2		(a)
13:36	MP32249-SD1	10		
13:42	MA52223-CCV3	1	X X	
13:46	MA52223-CCB4	1	X X	
13:52	MP32284-B1	1		
13:56	MP32284-MB1	1		
14:01	MP32284-S1	1		
14:06	MP32284-S2	1		
14:11	JD42918-1	1		(a)
14:16	MP32284-SD1	5		
14:22	ZZZZZZ	1		
14:27	ZZZZZZ	1		
14:32	MA52223-CCV4	1	X X	
14:37	MA52223-CCB5	1	X X	
14:42	ZZZZZZ	1		
14:47	ZZZZZZ	1		
14:52	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52223-CCV5	1	X X	
15:13	MA52223-CCB6	1	X X	
15:18	ZZZZZZ	1		
15:22	ZZZZZZ	1		

(a) Sample used for QC only; not part of login JD42497.

Element: As  
Element: Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:27	MA52223-STD1	2369 R	67137 R	8780 R	6285 R
10:33	MA52223-STD2	2245	62614	8598	5582
10:37	MA52223-ICV1	2302	63909	8687	5756
10:45	MA52223-ICB1	2372	66513	8778	6261
10:53	MA52223-ICCV1	2301	63353	8746	5728
11:00	MA52223-CCB1	2376	66450	8867	6252
11:05	MA52223-CRID1	2377	66359	8908	6219
11:10	MA52223-CRI1	2362	65555	8857	6130
11:15	MA52223-ICSA1	2129	57681	8541	5108
11:20	MA52223-ICSAB1	2120	57149	8466	5097
11:25	MA52223-HSTD1	2334	65581	8819	6096
11:30	MA52223-HSTD2	2145	58715	8510	5120
11:35	MP32253-B1	2310	63943	8861	5803
11:40	MP32253-MB1	2353	66072	8876	6174
11:45	MP32253-S1	2169	59491	8605	5197
11:50	MA52223-CCV1	2299	62263	8729	5681
11:55	MA52223-CCB2	2367	65430	8797	6181
12:00	MP32253-S2	2174	59570	8730	5202
12:05	JD42841-1	2157	59744	8685	5296
12:11	MP32253-SD1	2289	63269	8809	5819
12:16	ZZZZZZ	2305	63411	8850	5766
12:21	JD42497-28	2355	65608	8940	6162
12:26	ZZZZZZ	2364	65558	8861	6167
12:31	MA52223-CRI2	2334	64660	8837	6049
12:37	ZZZZZZ	2400	64909	9381	5803
12:42	ZZZZZZ	2349	64174	8985	5880
12:47	MA52223-CCV2	2291	62229	8777	5657
12:51	MA52223-CCB3	2359	65429	8850	6162
12:57	ZZZZZZ	2358	65986	8982	6173
13:02	ZZZZZZ	2358	65163	8869	6145
13:07	MA52223-CRID2	2349	65154	8858	6123
13:12	MA52223-ICSA2	2109	56308	8459	5033
13:17	MA52223-ICSAB2	2123	56127	8583	5043

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52223

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:22	MP32249-S1	2340	63187	9141	5677
13:27	MP32249-S2	2331	63207	9108	5692
13:32	DA43674-3	2325	63847	9186	5705
13:36	MP32249-SD1	2355	64630	8907	6044
13:42	MA52223-CCV3	2268	61752	8712	5603
13:46	MA52223-CCB4	2344	64950	8820	6117
13:52	MP32284-B1	2306	62920	8949	5777
13:56	MP32284-MB1	2344	65193	8963	6172
14:01	MP32284-S1	2163	59866	8783	5254
14:06	MP32284-S2	2157	59304	8729	5231
14:11	JD42918-1	2181	59416	8657	5334
14:16	MP32284-SD1	2285	62966	8893	5812
14:22	ZZZZZZ	2181	60144	8760	5374
14:27	ZZZZZZ	2193	60211	8765	5356
14:32	MA52223-CCV4	2272	62072	8830	5617
14:37	MA52223-CCB5	2338	63903	8783	6100
14:42	ZZZZZZ	2173	60320	8822	5362
14:47	ZZZZZZ	2168	60524	8922	5343
14:52	ZZZZZZ	2158	60245	8854	5313
14:58	ZZZZZZ	2156	59751	8819	5308
15:03	ZZZZZZ	2195	60303	8896	5337
15:08	MA52223-CCV5	2268	62116	8919	5605
15:13	MA52223-CCB6	2349	65197	8943	6135
15:18	ZZZZZZ	2310	63822	8949	6098
15:22	ZZZZZZ	2289	64665	8875	6093

R = Reference for ISTD limits, ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130
Istd#2	Yttrium (3600)	70-130
Istd#3	Yttrium (3710)	70-130
Istd#4	Indium	70-130



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Metal	Time: Sample ID:		10:45 ICB1		11:00 CCB1		11:55 CCB2		12:51 CCB3	
	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	16								
Antimony	6.0	2.5								
Arsenic	3.0	2	0.00	<3.0	-0.900	<3.0	1.10	<3.0	1.60	<3.0
Barium	200	.4								
Beryllium	1.0	.1								
Bismuth	20	3.6								
Boron	100	1.9								
Cadmium	3.0	.4								
Calcium	5000	5.6								
Cerium	100									
Chromium	10	.5								
Cobalt	50	.5								
Copper	10	1	anr							
Iron	100	11	-4.10	<100	-4.70	<100	9.20	<100	34.9	<100
Lead	3.0	1.2	anr							
Lithium	50	2.3								
Magnesium	5000	65								
Manganese	15	.2								
Molybdenum	20	.4								
Nickel	10	.3	anr							
Phosphorus	50	4.1								
Potassium	10000	55								
Selenium	10	3.5								
Silicon	200	1.6								
Silver	10	1.1								
Sodium	10000	11	anr							
Strontium	10	.1								
Sulfur	50	4.4								
Thallium	10	2.5								
Tin	10	1								
Titanium	10	.4								
Tungsten	50	2.8								
Vanadium	50	.6								

6.5.3  
6

No @ in  
ES

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: 13:46		Sample ID: CCB4			
Metal	RL	IDL	raw	final	
Aluminum	200	16			
Antimony	6.0	2.5			
Arsenic	3.0	2	-0.400	<3.0	✓
Barium	200	.4			
Beryllium	1.0	.1			
Bismuth	20	3.6			
Boron	100	1.9			
Cadmium	3.0	.4			
Calcium	5000	5.6			
Cerium	100				
Chromium	10	.5			
Cobalt	50	.5			
Copper	10	1	anr		
Iron	100	11	16.6	<100	
Lead	3.0	1.2	anr		
Lithium	50	2.3			
Magnesium	5000	65			
Manganese	15	.2			
Molybdenum	20	.4			
Nickel	10	.3	anr		
Phosphorus	50	4.1			
Potassium	10000	55			
Selenium	10	3.5			
Silicon	200	1.6			
Silver	10	1.1			
Sodium	10000	11	anr		
Strontium	10	.1			
Sulfur	50	4.4			
Thallium	10	2.5			
Tin	10	1			
Titanium	10	.4			
Tungsten	50	2.8			
Vanadium	50	.6			

No ④ in  
E3

6.5.3  
6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MF32253  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date:

04/12/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	150		
Antimony	6.0	2.5	4.7		
Arsenic	3.0	2	2.8	0.10	<3.0
Barium	200	.4	13		
Beryllium	1.0	.1	.5		
Bismuth	20	3.6	8.6		
Boron	100	1.9	10		
Cadmium	3.0	.4	1		
Calcium	5000	5.6	99		
Cerium	100				
Chromium	10	.5	2		
Cobalt	50	.5	2.6		
Copper	10	1	5.9		
Iron	100	11	32	23.8	<100
Lead	3.0	1.2	1.8		
Lithium	50	2.3	7.3		
Magnesium	5000	65	140		
Manganese	15	.2	1.4		
Molybdenum	20	.4	3.6		
Nickel	10	.3	1.7		
Phosphorus	50	4.1	18		
Potassium	10000	55	200		
Selenium	10	3.5	4.9		
Silicon	200	1.6	32		
Silver	10	1.1	6.1		
Sodium	10000	11	570		
Strontium	10	.1	2.7		
Sulfur	50	4.4	45		
Thallium	10	2.5	1.8		
Tin	10	1	3.7		
Titanium	10	.4	2.5		
Tungsten	50	2.8	40		
Vanadium	50	.6	1.8		

No @ in  
ES

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
QC Limits: to % Recovery

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:	10:53
Sample ID: ICCV	ICCV1
Metal	True
Results	% Rec

Aluminum			
Antimony			
Arsenic	2000	2010	100.5 ✓
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper	anr		
Iron	40000	40000	100.0 ✓
Lead	anr		
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium	anr		
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

6.5.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time:		10:37		11:50		12:47	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum							
Antimony							
Arsenic	2000	1970	98.5	2000	2030	101.5	2000
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	40000	41100	102.8	40000	40000	100.0	40000
Lead	anr						
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium	anr						
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

6.5.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNCCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52223      Units: ug/l

Time:	13:42
Sample ID:	CCV
Metal	True
Results	% Rec

Aluminum				
Antimony				
Arsenic	2000	2030	101.5	✓
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	40000	39700	99.3	✓
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

6.5.5

6

## HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNCROSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		11:25			11:30		
Sample ID:		HSTD	HSTD1	HSTD	HSTD2	HSTD	HSTD2
Metal		True	Results	% Rec	True	Results	% Rec
Aluminum							
Antimony							
Arsenic	8000		7430	92.9 ✓			
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron					200000	196000	98.0 ✓
Lead	anr						
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time:	CRI	CRIA	CRID	11:05		11:10		12:31	
Sample ID:	CRI	CRIA	CRID	CRID1	% Rec	CRID1	% Rec	CRID2	% Rec
Metal	True	True	True	Results		Results		Results	
Aluminum	200	500	100						
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0	3.30	110.0	7.80	97.5	8.70	108.8
Barium	200		4.0						
Beryllium	2.0		1.0						
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0						
Calcium	5000	2000	1000						
Cerium									
Chromium	10		2.0						
Cobalt	50		3.0						
Copper	10		2.0						
Iron	100	500				108	108.0	106	106.0
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100						
Manganese	15		3.0						
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000						
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0						

6.5.7  
6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52223 Units: ug/l

Time:				13:07		
Sample ID:	CRI	CRIA	CRID	CRID2	Results	% Rec
Metal	True	True	True			
Aluminum	200	500	100			
Antimony	6.0	20	3.0			
Arsenic	8.0	20	3.0	2.80	93.3	
Barium	200		4.0			
Beryllium	2.0		1.0			
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0			
Calcium	5000	2000	1000			
Cerium						
Chromium	10		2.0			
Cobalt	50		3.0			
Copper	10		2.0			
Iron	100	500				
Lead	3.0	20	2.5			
Lithium	50					
Magnesium	5000	2000	100			
Manganese	15		3.0			
Molybdenum	20					
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000			
Selenium	10	20	5.0			
Silicon	200					
Silver	5.0		2.0			
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0			
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0			

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SE041322M1.ICP  
QC Limits: 80 to 120 % Recovery

Date Analyzed: 04/13/22  
Run ID: MA52223

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID: Metal	ICSA True	ICSAB True	11:15 ICSA1 Results	% Rec	11:20 ICSAB1 Results	% Rec	13:12 ICSA2 Results	% Rec	13:17 ICSAB2 Results	% Rec
Aluminum	500000	500000	511000	102.2	520000	104.0	510000	102.0	513000	102.6
Antimony		1000	5.80		1020	102.0	5.50		1040	104.0
Arsenic		1000	1.60		1010	101.0	-0.300		1030	103.0
Barium		500	-46.6		429	85.8	-46.2		424	84.8
Beryllium		500	-0.400		464	92.8	-0.500		450	90.0
Bismuth		500	4.20		489	97.8	2.30		494	98.8
Boron		500	-2.70		475	95.0	-3.90		479	95.8
Cadmium		1000	-0.500		1030	103.0	-0.900		1010	101.0
Calcium	400000	400000	384000	96.0	398000	99.5	379000	94.8	388000	97.0
Cerium			147*		660*		151*		669*	
Chromium		500	-3.00		470	94.0	-2.40		482	96.4
Cobalt		500	-1.10		471	94.2	-1.50		482	96.4
Copper		500	-3.50		512	102.4	-2.60		520	104.0
Iron	200000	200000	190000	95.0	201000	100.5	192000	96.0	200000	100.0
Lead		1000	2.40		939	93.9	1.80		957	95.7
Lithium		500	5.20		569	113.6	4.50		567	113.4
Magnesium	500000	500000	499000	99.8	496000	99.2	495000	99.0	484000	96.8
Manganese		500	1.30		505	101.0	1.00		512	102.4
Molybdenum		500	-3.40		464	92.8	-3.70		467	93.4
Nickel		1000	-2.00		917	91.7	-1.50		917	91.7
Phosphorus		500	4.00		498	99.6	15.3		508	101.6
Potassium			147		172		159		165	
Selenium		1000	7.10		906	90.6	3.80		925	92.5
Silicon		500	-2.70		533	106.6	-4.80		537	107.4
Silver		1000	2.10		1040	104.0	-1.90		1050	105.0
Sodium			-32.2		-17.2		-25.6		-10.4	
Strontium		500	0.600		467	93.4	0.500		461	92.2
Sulfur		500	-6.40		465	93.0	-12.0		468	93.6
Thallium		1000	2.90		822	82.2	-0.700		930	93.0
Tin		500	-2.10		458	91.6	-3.00		464	92.8
Titanium		500	-0.700		495	99.0	-1.20		500	100.0
Tungsten		500	3.90		493	98.6	8.40		497	99.4
Vanadium		500	-0.700		500	100.0	0.00		508	101.6

2

6.5.8  
6

## MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 04/12/22

Metal	JD42841-1 Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	0.0	1920	2000	95.4 75-125
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	15800	42500	25000	106.8 75-125
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

Batch QC

6.11.2  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date:

04/12/22

Metal	JD42841-1 Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	0.0	1900	2000	95.0	1.0 20
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron	15800	41900	25000	104.4	1.4 20
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	anr				
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					

Batch QC

6.11.2  
6

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHEPAFW: Marcus Hook, PA

QC Batch ID: MP32253  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 04/12/22

Metal	BSP Result	Spikelet MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1920	2000	96.0	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	24500	25000	98.0	80-120
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: HP32253  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 04/12/22

JD42841-1		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum			
Antimony			
Arsenic	0.00	0.00	NC 0-10
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron	15800	16000	1.3 0-10
Lead	anr		
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium	anr		
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

Batch QC

6.1.4  
6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	FS Recov	Comments
13:35	MA52229-STD1	1		STDA
13:42	MA52229-STD2	1		STDB
13:47	MA52229-ICV1	1		
13:53	MA52229-ICV2	1		
14:00	MA52229-ICB1	1		
14:06	MA52229-ICCV1	1		
14:18	MA52229-CCB1	1		
14:22	MA52229-CRID1	1		
14:27	MA52229-CRI1	1		
14:32	MA52229-ICSA1	1		
14:37	MA52229-ICSAB1	1		
14:42	MA52229-HSTD1	1		
14:48	MA52229-HSTD2	1		
14:53	ZZZZZZ	1		
14:58	ZZZZZZ	1		
15:03	ZZZZZZ	1		
15:08	MA52229-CCV1	1		
15:13	MA52229-CCB2	1		
15:18	ZZZZZZ	1		
15:23	ZZZZZZ	1		
15:28	MP32248-S1	2		
15:33	MP32248-S2	2		
15:38	JD42748-1	2		(sample used for QC only; not part of login JD42497)
15:42	MP32248-SD1	10		
----->	Last reportable sample/prep for job JD42497			
15:47	MA52229-CCV2	1		
15:52	MA52229-CCB3	1		
15:57	ZZZZZZ	1		
16:02	ZZZZZZ	1		
16:07	ZZZZZZ	1		
16:12	ZZZZZZ	1		
16:17	ZZZZZZ	1		
16:23	ZZZZZZ	1		
16:27	ZZZZZZ	1		

QC only

6.6

6

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:32	ZZZZZZ	1		
16:38	ZZZZZZ	1		
16:43	MA52229-CCV3	1		
16:47	MA52229-CCB4	1		
16:53	MP32273-MB1	1		
16:58	MP32273-B1	1		
17:02	MP32273-S1	1		Ca, S high
17:07	MP32273-S2	1		Ca, S high
17:12	JD42855-1A	1		(sample used for QC only; not part of login JD42497)
17:18	MP32273-SD1	5		Ca, S high
17:23	ZZZZZZ	1		
17:28	ZZZZZZ	1		
17:33	ZZZZZZ	1		
17:38	ZZZZZZ	1		
17:43	MA52229-CCV4	1		
17:47	MA52229-CCB5	1		
17:52	MP32280-MB1	1		batch to reanalyze, spk blank out
17:57	MP32280-B1	1		
18:02	MP32280-S1	1		
18:07	MP32280-S2	1		
18:12	JD42834-2	1		(sample used for QC only; not part of login JD42497)
18:17	MP32280-SD1	5		
18:22	MP32280-PS1	1		
18:27	ZZZZZZ	1		
18:32	ZZZZZZ	1		
18:37	ZZZZZZ	1		
18:42	MA52229-CCV5	1		
18:46	MA52229-CCB6	1		
18:52	MA52229-CRI2	1		
18:56	MA52229-CRID2	1		
19:02	MA52229-ICSA2	1		
19:07	MA52229-ICSAB2	1		
19:12	MA52229-CCV6	1		



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution PS Factor	Recov	Comments
19:16	MA52229-CCB7	1		
Last reportable CCB for job JD42497				
19:21	ZZZZZZ	1		
19:26	ZZZZZZ	1		
19:31	ZZZZZZ	1		
19:36	ZZZZZZ	1		
19:41	ZZZZZZ	1		
19:46	ZZZZZZ	1		
19:51	ZZZZZZ	1		
19:56	ZZZZZZ	1		
20:01	ZZZZZZ	1		
20:06	ZZZZZZ	1		
20:12	MA52229-CCV7	1		
20:16	MA52229-CCB8	1		
20:22	ZZZZZZ	1		
20:27	ZZZZZZ	1		
20:32	ZZZZZZ	1		
20:37	ZZZZZZ	1		
20:42	ZZZZZZ	1		
20:47	ZZZZZZ	1		
20:52	ZZZZZZ	1		
20:56	ZZZZZZ	1		
21:02	ZZZZZZ	1		
21:06	ZZZZZZ	1		
21:11	MA52229-CCV8	1		
21:16	MA52229-CCB9	1		
21:21	ZZZZZZ	1		
21:26	ZZZZZZ	1		
21:31	ZZZZZZ	1		
21:36	ZZZZZZ	1		
21:41	ZZZZZZ	1		
21:46	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
 Analyst: ND  
 Parameters: Fe

Date Analyzed: 04/13/22  
 Run ID: MA52229

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Element: Fe Dilution e
13:47	MA52229-ICV1	1
13:53	MA52229-ICV2	1 X
14:00	MA52229-ICB1	1 X
14:06	MA52229-ICCV1	1 X
14:18	MA52229-CCB1	1 X
14:22	MA52229-CRID1	1 X
14:27	MA52229-CRI1	1 X
14:32	MA52229-ICSA1	1 X
14:37	MA52229-ICSAB1	1 X
14:42	MA52229-HSTD1	1 X
14:48	MA52229-HSTD2	1 X
14:53	ZZZZZZ	1
14:58	ZZZZZZ	1
15:03	ZZZZZZ	1
15:08	MA52229-CCV1	1 X
15:13	MA52229-CCB2	1 X
15:18	ZZZZZZ	1
15:23	ZZZZZZ	1
15:28	MP32248-S1	2 X
15:33	MP32248-S2	2 X
15:38	JD42748-1	2 (a)
15:42	MP32248-SD1	10
15:47	MA52229-CCV2	1 X
15:52	MA52229-CCB3	1 X
15:57	ZZZZZZ	1
16:02	ZZZZZZ	1
16:07	ZZZZZZ	1
16:12	ZZZZZZ	1
16:17	ZZZZZZ	1
16:23	ZZZZZZ	1
16:27	ZZZZZZ	1
16:32	ZZZZZZ	1
16:38	ZZZZZZ	1
		Element: Fe

6.6.1  
6

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Element: Dilution	Result
16:43	MA52229-CCV3	1	X
16:47	MA52229-CCB4	1	X
16:53	MP32273-MB1	1	X
16:58	MP32273-B1	1	X
17:02	MP32273-S1	1	X
17:07	MP32273-S2	1	X
17:12	JD42855-1A	1	X (a)
17:18	MP32273-SD1	5	X
17:23	ZZZZZZ	1	
17:28	ZZZZZZ	1	
17:33	ZZZZZZ	1	
17:38	ZZZZZZ	1	
17:43	MA52229-CCV4	1	X
17:47	MA52229-CCB5	1	X
17:52	MP32280-MB1	1	Batch to reanalyze, spk blank out
17:57	MP32280-B1	1	
18:02	MP32280-S1	1	
18:07	MP32280-S2	1	
18:12	JD42834-2	1	
18:17	MP32280-SD1	5	
18:22	MP32280-PS1	1	
18:27	ZZZZZZ	1	
18:32	ZZZZZZ	1	
18:37	ZZZZZZ	1	
18:42	MA52229-CCV5	1	X
18:46	MA52229-CCB6	1	X
18:52	MA52229-CRI2	1	X
18:56	MA52229-CRID2	1	X
19:02	MA52229-ICSA2	1	X
19:07	MA52229-ICSAB2	1	X
19:12	MA52229-CCV6	1	X
19:16	MA52229-CCB7	1	X
19:21	ZZZZZZ	1	
		Element: Fe	

6.6.1

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REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52229

Time	Sample Description	Element: Fe Dilution
19:26	ZZZZZZ	1
19:31	ZZZZZZ	1
19:36	ZZZZZZ	1
19:41	ZZZZZZ	1
19:46	ZZZZZZ	1
19:51	ZZZZZZ	1
19:56	ZZZZZZ	1
20:01	ZZZZZZ	1
20:06	ZZZZZZ	1
20:12	MA52229-CCV7	1 X
20:16	MA52229-CCB8	1 X
20:22	ZZZZZZ	1
20:27	ZZZZZZ	1
20:32	ZZZZZZ	1
20:37	ZZZZZZ	1
20:42	ZZZZZZ	1
20:47	ZZZZZZ	1
20:52	ZZZZZZ	1
20:56	ZZZZZZ	1
21:02	ZZZZZZ	1
21:06	ZZZZZZ	1
21:11	MA52229-CCV8	1 X
21:16	MA52229-CCB9	1 X
21:21	ZZZZZZ	1
21:26	ZZZZZZ	1
21:31	ZZZZZZ	1
21:36	ZZZZZZ	1
21:41	ZZZZZZ	1
21:46	ZZZZZZ	1

(a) Sample used for QC only; not part of login JD42497.

Element: Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22  
Run ID: MA52229  
Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:35	MA52229-STD1	6998 R	203320 R	19654 R	11938 R
13:42	MA52229-STD2	6791	191180	19602	10810
13:47	MA52229-ICV1	No results reported for the elements associated with this internal standard.			
13:53	MA52229-ICV2	7488	213240	21574	11823
14:00	MA52229-ICB1	7376	211290	19899	12411
14:06	MA52229-ICCV1	7183	201250	19735	11476
14:18	MA52229-CCB1	7480	213790	20178	12523
14:22	MA52229-CRID1	7407	213100	20101	12362
14:27	MA52229-CRI1	7390	213300	20320	12270
14:32	MA52229-ICSA1	6829	190030	20182	10432
14:37	MA52229-ICSAB1	6849	192080	20247	10463
14:42	MA52229-HSTD1	7454	213170	20495	12392
14:48	MA52229-HSTD2	6897	193600	20317	10458
14:53	ZZZZZZ	7215	203700	19592	12294
14:58	ZZZZZZ	7197	207690	19834	12347
15:03	ZZZZZZ	7328	202860	19883	12378
15:08	MA52229-CCV1	7430	206630	20771	11698
15:13	MA52229-CCB2	7571	217420	20712	12644
15:18	ZZZZZZ	25185 !	641950 !	48057 !	39035 !
15:23	ZZZZZZ	7629	202710	16558	12700
15:28	MP32248-S1	7322	196120	16993	11515
15:33	MP32248-S2	7635	215490	21456	12017
15:38	JD42748-1	7486	212630	21242	11671
15:42	MP32248-SD1	7531	214670	20920	12293
15:47	MA52229-CCV2	7363	209300	20620	11736
15:52	MA52229-CCB3	7607	218250	20393	12791
15:57	ZZZZZZ	7688	220620	20985	12920
16:02	ZZZZZZ	7243	206600	21339	11157
16:07	ZZZZZZ	7075	200330	21090	10655
16:12	ZZZZZZ	7422	213790	21400	11726
16:17	ZZZZZZ	7053	200170	21034	10708
16:23	ZZZZZZ	7766	219850	21690	12385
16:27	ZZZZZZ	7703	220470	21847	12227

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:32	ZZZZZZ	7787	221600	23646	10624
16:38	ZZZZZZ	7812	224290	21714	12768
16:43	MA52229-CCV3	7595	213130	21430	12023
16:47	MA52229-CCB4	7733	221760	21220	12949
16:53	MP32273-MB1	7231	196630	19462	12365
16:58	MP32273-B1	7166	201610	19798	11730
17:02	MP32273-S1	6197	179420	19030	9424
17:07	MP32273-S2	6196	179140	18865	9432
17:12	JD42855-1A	6295	181040	19065	9562
17:18	MP32273-SD1	6995	200540	20143	11029
17:23	ZZZZZZ	7299	208900	20104	12292
17:28	ZZZZZZ	7028	201700	19854	11511
17:33	ZZZZZZ	6976	199760	19482	11496
17:38	ZZZZZZ	7039	200960	19628	11594
17:43	MA52229-CCV4	7323	206490	20465	11644
17:47	MA52229-CCB5	7583	216580	20516	12699
17:52	MP32280-MB1	No results reported for the elements associated with this internal standard.			
17:57	MP32280-B1	No results reported for the elements associated with this internal standard.			
18:02	MP32280-S1	No results reported for the elements associated with this internal standard.			
18:07	MP32280-S2	No results reported for the elements associated with this internal standard.			
18:12	JD42834-2	No results reported for the elements associated with this internal standard.			
18:17	MP32280-SD1	No results reported for the elements associated with this internal standard.			
18:22	MP32280-PS1	No results reported for the elements associated with this internal standard.			
18:27	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:32	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:37	ZZZZZZ	No results reported for the elements associated with this internal standard.			
18:42	MA52229-CCV5	7420	208250	20354	11736
18:46	MA52229-CCB6	7640	216200	20232	12736
18:52	MA52229-CRI2	7556	217180	20486	12497
18:56	MA52229-CRID2	7618	216540	20480	12700
19:02	MA52229-ICSA2	6832	191210	19977	10414
19:07	MA52229-ICSAB2	6932	193210	20068	10534
19:12	MA52229-CCV6	7563	212790	20744	11975

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP

Date Analyzed: 04/13/22

Methods: EPA 200.7, SW846 6010D

Analyst: ND

Run ID: MA52229

Parameters: Fe

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
19:16	MA52229-CCB7	7704	219780	20833	12870
19:21	ZZZZZZ	7511	211200	20466	12395
19:26	ZZZZZZ	7467	211930	20770	12196
19:31	ZZZZZZ	5940	169930	19387	8770
19:36	ZZZZZZ	7220	205640	20237	11776
19:41	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:46	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:51	ZZZZZZ	No results reported for the elements associated with this internal standard.			
19:56	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:01	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:12	MA52229-CCV7	7591	215040	21311	12070
20:16	MA52229-CCB8	7742	222680	21320	13004
20:22	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:27	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:32	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:37	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:42	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:47	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:52	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:56	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:02	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:11	MA52229-CCV8	7626	213710	21322	12111
21:16	MA52229-CCB9	7840	223750	20978	13141
21:21	ZZZZZZ	7830	223960	21453	13091
21:26	ZZZZZZ	7786	223980	21202	13021
21:31	ZZZZZZ	7852	223800	21276	13197
21:36	ZZZZZZ	7573	215890	20504	12885
21:41	ZZZZZZ	7382	206160	20453	11980
21:46	ZZZZZZ	7364	208530	20439	11971

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %

6.6.2

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BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			14:00 ICB1		14:18 CCB1		15:13 CCB2		15:52 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	anr							
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	3.80	<100	1.30	<100	1.90	<100	4.30	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7	anr							
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
QC Limits: result < RL

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			16:47 CCB4	17:47 CCB5		18:46 CCB6		19:16 CCB7		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	anr							
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	-1.60	<100	-0.500	<100	0.500	<100	3.00	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7	anr							
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3	anr							
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

6.6.3

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CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52229 Units: ug/l

Time:	14:06
Sample ID:	ICCV
Metal	True
	ICCV1
	Results % Rec

Aluminum	anr		
Antimony	anr		
Arsenic	anr		
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	40200	100.5
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon	anr		
Silver	anr		
Sodium	anr		
Strontium			
Sulfur	anr		
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.6.4  
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CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time:		13:53		15:08		15:47	
Sample ID:	ICV	ICV2	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	40800	102.0	40000	41600	104.5	40000
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon	anr						
Silver	anr						
Sodium	anr						
Strontium							
Sulfur	anr						
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

6.6.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time: 16:43		17:43		18:42	
Sample ID:	CCV	CCV3	CCV	CCV4	CCV
Metal	True	Results % Rec	True	Results % Rec	True
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	40000	40900 102.3	40000	40200 100.5	40000 39700 99.3 ✓
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon	anr				
Silver	anr				
Sodium	anr				
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNCCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52229      Units: ug/l

Time: 19:12		Sample ID: CCV		CCV6	
Metal	True	Results	% Rec		
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	40000	37600	94.0		
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon	anr				
Silver	anr				
Sodium	anr				
Strontium					
Sulfur	anr				
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

6.6.5  
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## HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHEPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 04/13/22  
Run ID: MA52229

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:	14:42	14:48
Sample ID:	HSTD	HSTD
Metal	True	True
	Results	Results
	% Rec	% Rec

Aluminum

Antimony anr

Arsenic anr

Barium anr

Beryllium anr

Bismuth

Boron

Cadmium anr

Calcium

Cerium

Chromium anr

Cobalt anr

Copper anr

Iron 200000 199000 99.5 ✓

Lead anr

Lithium

Magnesium

Manganese anr

Molybdenum

Nickel anr

Phosphorus

Potassium

Selenium anr

Silicon anr

Silver anr

Sodium

Strontium

Sulfur anr

Thallium anr

Tin

Titanium

Tungsten

Vanadium anr

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time:		14:22		14:27		18:52	
Sample ID:	CRI	CRI1	CRI2	CRI1	CRI2	CRI1	CRI2
Metal	True	True	True	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr			
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	anr			
Barium	200		4.0	anr			
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0	anr			
Calcium	5000	2000	1000	anr			
Cerium							
Chromium	10		2.0	anr			
Cobalt	50		3.0	anr			
Copper	10		2.0				
Iron	100	500			105	105.0	98.5
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100	anr			
Manganese	15		3.0	anr			
Molybdenum	20						
Nickel	10		4.0	anr			
Phosphorus	50						
Potassium	5000		2000	anr			
Selenium	10	20	5.0	anr			
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000	anr			
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0	anr			

6.6.7

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LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SC041322M2.ICP Date Analyzed: 04/13/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52229 Units: ug/l

Time:				18:56	
Sample ID:	CRI	CRIA	GRID	GRID2	
Metal	True	True	True	Results	% Rec
Aluminum	200	500	100	anr	
Antimony	6.0	20	3.0		
Arsenic	8.0	20	3.0	anr	
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0		
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	
Cobalt	50		3.0	anr	
Copper	10		2.0		
Iron	100	500			
Lead	3.0	20	2.5		
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0		
Silicon	200				
Silver	5.0		2.0		
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0		
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	anr	



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041322M2.ICP      Date Analyzed: 04/13/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52229      Units: ug/l

Time:	Sample ID:	ICSA	ICSAB	14:32		14:37		19:02		19:07	
Metal		True	True	ICSA1	% Rec	ICSAB1	% Rec	ICSA2	% Rec	ICSAB2	% Rec
Aluminum		500000	500000	501000	100.2	506000	101.2	484000	96.8	490000	98.0
Antimony			1000	-1.80		949	94.9	0.400		916	91.6
Arsenic			1000	1.00		945	94.5	0.00		891	89.1
Barium			500	6.20		455	91.0	5.90		430	86.0
Beryllium			500	0.100		447	89.4	0.100		428	85.6
Bismuth			500	-13.2		437	87.4	-15.8		415	83.0
Boron			500	1.80		451	90.2	0.400		433	86.6
Cadmium			1000	0.200		942	94.2	0.200		905	90.5
Calcium	400000	400000	377000	94.3		393000	98.3	365000	91.3	374000	93.5
Cerium				24.5		471*		25.4		456*	
Chromium			500	-1.00		441	88.2	-1.40		422	84.4
Cobalt			500	0.900		458	91.6	0.700		435	87.0
Copper			500	4.40		481	96.2	4.30		495	99.0
Iron	200000	200000	193000	96.5		203000	101.5	184000	92.0	195000	97.5
Lead			1000	0.00		891	89.1	1.40		856	85.6
Lithium			500	-5.90		519	103.8	-5.70		492	98.4
Magnesium	500000	500000	497000	99.4		487000	97.4	470000	94.0	464000	92.8
Manganese			500	0.400		472	94.4	0.100		449	89.8
Molybdenum			500	-2.50		449	89.8	-1.00		425	85.0
Nickel			1000	-0.800		885	88.5	-0.900		847	84.7
Phosphorus			500	-2.30		432	86.4	-0.100		415	83.0
Potassium				-689		-719		-665		-613	
Selenium			1000	0.400		853	85.3	-6.00		807	80.7
Silicon			500	5.80		498	99.6	5.80		479	95.8
Silver			1000	4.20		983	98.3	3.80		952	95.2
Sodium				114		98.9		130		140	
Strontium			500	-1.40		450	90.0	-1.40		428	85.6
Sulfur			500	-19.8		432	86.4	-10.6		427	85.4
Thallium			1000	-2.10		878	87.8	-2.20		848	84.8
Tin			500	-5.40		441	88.2	-4.90		416	83.2
Titanium			500	-1.70		459	91.8	-1.80		442	88.4
Tungsten			500	-1.30		465	93.0	3.20		440	88.0
Vanadium			500	1.70		458	91.6	2.90		438	87.6

6.6.8

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SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:28	MA52233-STD1	1		STDA
08:33	MA52233-STD2	1		STDB
08:38	MA52233-ICV1	1		
08:44	MA52233-ICB1	1		
08:49	MA52233-CCV1	1		
08:54	MA52233-CCB1	1		
08:59	MA52233-CRID1	1		
09:05	MA52233-CRI1	1		
09:10	MA52233-ICSA1	1		
09:15	MA52233-ICSAB1	1		
09:20	ZZZZZZ	1		
09:25	ZZZZZZ	1		
09:30	MA52233-HSTD1	1		
09:36	MA52233-HSTD2	1		
09:41	MP32280-B1	1		
09:46	ZZZZZZ	1		
09:51	MA52233-CCV2	1		
09:56	MA52233-CCB2	1		
10:01	ZZZZZZ	1		
10:06	ZZZZZZ	1		
10:11	MP32280-MB1	1		
10:16	MP32280-S1	1		
10:21	MP32280-S2	1		
10:26	JD42834-2	1		(sample used for QC only; not part of login JD42497)
10:31	MP32280-SD1	5		
10:36	MP32280-PS1	1		
10:41	MA52233-CCV3	1		
10:46	MA52233-CCB3	1		
10:51	ZZZZZZ	1		
10:56	ZZZZZZ	1		
11:01	ZZZZZZ	1		
11:06	ZZZZZZ	1		
11:11	ZZZZZZ	1		

QC only

6.7

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SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, FA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:16	MA52233-CCV4	1		
11:21	MA52233-CCB4	1		
11:26	MA52233-CRID2	1		
11:31	MP32253-S1	5		
11:36	MP32253-S2	5		
11:41	JD42841-1	5		(sample used for QC only; not part of login JD42497)
11:46	MP32253-SD1	25		
----->	Last reportable sample/prep for job JD42497			
11:51	ZZZZZZ	5		
11:56	ZZZZZZ	5		
12:01	ZZZZZZ	5		
12:06	ZZZZZZ	5		
12:11	MA52233-CCV5	1		
12:16	MA52233-CCB5	1		
12:21	ZZZZZZ	1		
12:26	MA52233-CRI2	1		
12:32	ZZZZZZ	2		
12:37	ZZZZZZ	1		
12:42	ZZZZZZ	5		
12:47	ZZZZZZ	5		
12:52	ZZZZZZ	5		
12:57	ZZZZZZ	1		
13:02	ZZZZZZ	1		
13:07	MA52233-CCV6	1		
13:12	MA52233-CCB6	1		
13:17	MA52233-ICSA2	1		
13:22	MA52233-ICSAB2	1		
13:27	ZZZZZZ	5		
13:33	ZZZZZZ	25		
13:38	ZZZZZZ	1		
13:43	MA52233-CCV7	1		
13:48	MA52233-CCB7	1		
----->	Last reportable CCB for job JD42497			
13:53	ZZZZZZ	1		
13:58	ZZZZZZ	1		

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Element: Dilution	A S
08:38	MA52233-ICV1	1	X
08:44	MA52233-ICB1	1	X
08:49	MA52233-CCV1	1	X
08:54	MA52233-CCB1	1	X
08:59	MA52233-CRID1	1	X
09:05	MA52233-CRI1	1	X
09:10	MA52233-ICSA1	1	X
09:15	MA52233-ICSAB1	1	X
09:20	ZZZZZZ	1	
09:25	ZZZZZZ	1	
09:30	MA52233-HSTD1	1	X
09:36	MA52233-HSTD2	1	X
09:41	MP32280-B1	1	
09:46	ZZZZZZ	1	
09:51	MA52233-CCV2	1	X
09:56	MA52233-CCB2	1	X
10:01	ZZZZZZ	1	
10:06	ZZZZZZ	1	
10:11	MP32280-MB1	1	X
10:16	MP32280-S1	1	
10:21	MP32280-S2	1	
10:26	JD42834-2	1	(a)
10:31	MP32280-SD1	5	
10:36	MP32280-PS1	1	
10:41	MA52233-CCV3	1	X
10:46	MA52233-CCB3	1	X
10:51	ZZZZZZ	1	
10:56	ZZZZZZ	1	
11:01	ZZZZZZ	1	
11:06	ZZZZZZ	1	
11:11	ZZZZZZ	1	
11:16	MA52233-CCV4	1	X
11:21	MA52233-CCB4	1	X
		Element: A S	

REPORTED ELEMENTS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52233

Time	Sample Description	Element: A Dilution S
11:26	MA52233-CRID2	1 X
11:31	MP32253-S1	5 X
11:36	MP32253-S2	5 X
11:41	JD42841-1	5 (a)
11:46	MP32253-SD1	25 X
11:51	ZZZZZZ	5
11:56	ZZZZZZ	5
12:01	ZZZZZZ	5
12:06	ZZZZZZ	5
12:11	MA52233-CCV5	1 X
12:16	MA52233-CCB5	1 X
12:21	ZZZZZZ	1
12:26	MA52233-CRI2	1 X
12:32	ZZZZZZ	2
12:37	ZZZZZZ	1
12:42	ZZZZZZ	5
12:47	ZZZZZZ	5
12:52	ZZZZZZ	5
12:57	ZZZZZZ	1
13:02	ZZZZZZ	1
13:07	MA52233-CCV6	1 X
13:12	MA52233-CCB6	1 X
13:17	MA52233-ICSA2	1 X
13:22	MA52233-ICSAB2	1 X
13:27	ZZZZZZ	5
13:33	ZZZZZZ	25
13:38	ZZZZZZ	1
13:43	MA52233-CCV7	1 X
13:48	MA52233-CCB7	1 X
13:53	ZZZZZZ	1
13:58	ZZZZZZ	1
14:03	ZZZZZZ	1

(a) Sample used for QC only; not part of login JD42497.

Element: A  
S

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
08:28	MA52233-STD1	8063 R	231460 R	22667 R	13474 R
08:33	MA52233-STD2	7736	218280	22621	12069
08:38	MA52233-ICV1	7903	235960	22584	12471
08:44	MA52233-ICB1	8057	231380	22743	13449
08:49	MA52233-CCV1	7898	222130	22630	12468
08:54	MA52233-CCB1	8015	230160	22321	13398
08:59	MA52233-CRID1	8073	228290	22327	13447
09:05	MA52233-CRI1	8050	228170	22490	13289
09:10	MA52233-ICSA1	7419	207590	22174	11208
09:15	MA52233-ICSAB1	7418	208150	22206	11203
09:20	ZZZZZZ	22022 !	585660 !	48634 !	34607 !
09:25	ZZZZZZ	22110 !	594320 !	48681 !	34802 !
09:30	MA52233-HSTD1	8027	225790	22542	13290
09:36	MA52233-HSTD2	7492	210400	22139	11223
09:41	MP32280-B1	8076	227630	22890	12935
09:46	ZZZZZZ	7826	222470	21660	13247
09:51	MA52233-CCV2	7856	221780	22303	12446
09:56	MA52233-CCB2	8151	229450	22435	13640
10:01	ZZZZZZ	7795	222420	21661	13263
10:06	ZZZZZZ	7765	221070	21590	13243
10:11	MP32280-MB1	8146	233520	22932	13671
10:16	MP32280-S1	7869	221100	23221	11931
10:21	MP32280-S2	7811	219340	22778	11965
10:26	JD42834-2	7923	222610	23067	12221
10:31	MP32280-SD1	8074	228120	22633	13058
10:36	MP32280-PS1	7858	222400	23142	12065
10:41	MA52233-CCV3	7967	224300	22520	12634
10:46	MA52233-CCB3	8018	216580	21268	13370
10:51	ZZZZZZ	8026	222580	21537	12737
10:56	ZZZZZZ	8136	226350	21846	12816
11:01	ZZZZZZ	8026	224820	22219	11948
11:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
11:11	ZZZZZZ	8047	219080	21524	12785

## INTERNAL STANDARD SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
Analyst: ND  
Parameters: As

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
11:16	MA52233-CCV4	7877	219090	21250	12410
11:21	MA52233-CCB4	8005	224240	20823	13315
11:26	MA52233-CRID2	8033	223950	20893	13328
11:31	MP32253-S1	7919	220930	21072	12652
11:36	MP32253-S2	7909	220250	21120	12637
11:41	JD42841-1	7918	221130	20965	12767
11:46	MP32253-SD1	8034	225480	20808	13224
11:51	ZZZZZZ	7836	220010	21057	12509
11:56	ZZZZZZ	7830	215720	20820	12318
12:01	ZZZZZZ	7814	217470	20751	12295
12:06	ZZZZZZ	7911	220610	21037	12190
12:11	MA52233-CCV5	7873	218360	20982	12401
12:16	MA52233-CCB5	8090	224650	20839	13424
12:21	ZZZZZZ	8242	231090	21552	13658
12:26	MA52233-CRI2	7999	223580	20826	13175
12:32	ZZZZZZ	8055	221360	21491	12412
12:37	ZZZZZZ	8312	231850	21689	13756
12:42	ZZZZZZ	7756	210630	21013	11929
12:47	ZZZZZZ	8077	222320	21215	13037
12:52	ZZZZZZ	8211	225470	21534	13073
12:57	ZZZZZZ	8139	222490	21689	12588
13:02	ZZZZZZ	7620	212050	21165	11306
13:07	MA52233-CCV6	8053	222270	21004	12568
13:12	MA52233-CCB6	8231	229560	21318	13541
13:17	MA52233-ICSA2	7570	208600	21182	11361
13:22	MA52233-ICSAB2	7638	207570	21343	11442
13:27	ZZZZZZ	8199	227810	21430	12879
13:33	ZZZZZZ	8106	223850	21276	12874
13:38	ZZZZZZ	8223	226290	21495	12844
13:43	MA52233-CCV7	8050	221870	21318	12533
13:48	MA52233-CCB7	8209	228650	21047	13486
13:53	ZZZZZZ	7876	220470	20545	13241
13:58	ZZZZZZ	7925	219230	20418	13126

# INTERNAL STANDARD SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
 Analyst: ND Run ID: MA52233  
 Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
14:03	ZZZZZZ	8291	230240	21556	13568

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

6.7.2

6



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNCOSS - Sunco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52233      Units: ug/l

Time: Sample ID:			08:44 ICB1		08:54 CCB1		09:56 CCB2		10:46 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.00	<3.0	-0.800	<3.0	-0.100	<3.0	0.500	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

6.7.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
QC Limits: result < RL

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			11:21 CCB4	12:16 CCB5		13:12 CCB6		13:48 CCB7		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.100	<3.0	0.100	<3.0	0.200	<3.0	0.00	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6	anr							
Cerium	100									
Chromium	10	.3	anr							
Cobalt	50	.4	anr							
Copper	10	.8	anr							
Iron	100	5.3	anr							
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6	anr							

6.7.3  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time:		08:38			08:49			09:51		
Sample ID:		ICV	ICV1	CCV	CCV1	CCV	CCV2	Results	% Rec	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Aluminum	anr									
Antimony	anr									
Arsenic	2000	2000	100.0	2000	2040	102.0	2000	2040	102.0	✓
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	anr									
Calcium	anr									
Cerium										
Chromium	anr									
Cobalt	anr									
Copper	anr									
Iron	anr									
Lead	anr									
Lithium										
Magnesium	anr									
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur										
Thallium	anr									
Tin										
Titanium										
Tungsten										
Vanadium	anr									

6.7.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPEFW: Marcus Hook, PA

File ID: SC041422M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 04/14/22  
Run ID: MA52233

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		10:41			11:16			12:11		
Sample ID:		CCV	CCV3	CCV	CCV4	CCV	CCV5			
Metal		True	Results % Rec	True	Results % Rec	True	Results % Rec			
Aluminum	anr									
Antimony	anr									
Arsenic	2000	2020	101.0	2000	1980	99.0	2000	1950	97.5	✓
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	anr									
Calcium	anr									
Cerium										
Chromium	anr									
Cobalt	anr									
Copper	anr									
Iron	anr									
Lead	anr									
Lithium										
Magnesium	anr									
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur										
Thallium	anr									
Tin										
Titanium										
Tungsten										
Vanadium	anr									

6.7.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPATW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52233      Units: ug/l

Time:		13:07		13:43	
Sample ID: CCV		CCV6		CCV7	
Metal	True	Results	% Rec	True	Results % Rec
Aluminum	anr				
Antimony	anr				
Arsenic	2000	1920	96.0	2000	1970 98.5 ✓
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

6.7.4  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD42497  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52233 Units: ug/l

Time:		09:30			09:36		
Sample ID:		HSTD	HSTD1	HSTD	HSTD2	HSTD	HSTD2
Metal	True	Results	% Rec	True	Results	% Rec	

Aluminum

Antimony anr

Arsenic 8000 7570 94.6

Barium anr

Beryllium anr

Bismuth

Boron

Cadmium anr

Calcium

Cerium

Chromium anr

Cobalt anr

Copper anr

Iron

Lead anr

Lithium

Magnesium

Manganese anr

Molybdenum

Nickel anr

Phosphorus

Potassium

Selenium anr

Silicon

Silver anr

Sodium

Strontium

Sulfur

Thallium anr

Tin

Titanium

Tungsten

Vanadium anr

6.7.5  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICF Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52233 Units: ug/l

Time:	08:59		09:05		11:26				
Sample ID:	CRI	CRIA	CRID	CRID1	CRID2	CRID3			
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0						
Arsenic	8.0	20	3.0			7.70	96.3	2.50	83.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0						
Iron	100	500							
Lead	3.0	20	2.5						
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0						
Silicon	200								
Silver	5.0		2.0						
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0						
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

6.7.6  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP Date Analyzed: 04/14/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52233 Units: ug/l

Time:				12:26		
Sample ID:	CRI	CRIA	CRID	CRI2	Results	% Rec
Metal	True	True	True			
Aluminum	200	500	100	anr		
Antimony	6.0	20	3.0	anr		
Arsenic	8.0	20	3.0	9.50	118.8	
Barium	200		4.0	anr		
Beryllium	2.0		1.0	anr		
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0	anr		
Calcium	5000	2000	1000	anr		
Cerium						
Chromium	10		2.0	anr		
Cobalt	50		3.0	anr		
Copper	10		2.0	anr		
Iron	100	500		anr		
Lead	3.0	20	2.5	anr		
Lithium	50					
Magnesium	5000	2000	100	anr		
Manganese	15		3.0	anr		
Molybdenum	20					
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000	anr		
Selenium	10	20	5.0	anr		
Silicon	200					
Silver	5.0		2.0	anr		
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0	anr		
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0	anr		

6.7.6

6



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD42497  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC041422M1.ICP      Date Analyzed: 04/14/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52233      Units: ug/l

2.1

Time:	Sample ID:	ICSA	ICSAB	09:10	09:15	13:17	13:22			
Metal	True	True	ICSA1	% Rec	ICSAB1	% Rec	ICSA2	% Rec	ICSAB2	% Rec
Aluminum	500000	500000	521000	104.2	522000	104.4	507000	101.4	507000	101.4
Antimony		1000	1.60		983	98.3	3.00		911	91.1
Arsenic		1000	-0.500		973	97.3	-0.400		927	92.7
Barium		500	6.30		469	93.8	6.00		455	91.0
Beryllium		500	0.100		466	93.2	0.100		441	88.2
Bismuth		500	8.60		482	96.4	11.6		445	89.0
Boron		500	-0.500		462	92.4	0.00		430	86.0
Cadmium		1000	0.300		977	97.7	0.00		908	90.8
Calcium	400000	400000	392000	98.0	406000	101.5	388000	97.0	388000	97.0
Cerium			27.9		492*		27.0		476*	
Chromium		500	-0.900		454	90.8	-0.900		452	90.4
Cobalt		500	0.600		467	93.4	0.800		450	90.0
Copper		500	2.40		485	97.0	1.10		449	89.8
Iron	200000	200000	199000	99.5	210000	105.0	194000	97.0	204000	102.0
Lead		1000	0.900		913	91.3	0.00		889	88.9
Lithium		500	-7.00		537	107.4	-7.50		511	102.2
Magnesium	500000	500000	513000	102.6	503000	100.6	501000	100.2	491000	98.2
Manganese		500	0.200		485	97.0	-0.100		476	95.2
Molybdenum		500	-1.90		463	92.6	-2.30		440	88.0
Nickel		1000	-1.00		902	90.2	-1.30		876	87.6
Phosphorus		500	-21.0		435	87.0	-29.3		411	82.2
Potassium			-384		-400		-383		-418	
Selenium		1000	5.70		890	89.0	8.00		845	84.5
Silicon		500	8.30		510	102.0	4.80		479	95.8
Silver		1000	4.50		1020	102.0	4.10		972	97.2
Sodium			92.4		118		78.9		97.4	
Strontium		500	-1.40		464	92.8	-1.60		444	88.8
Sulfur		500	-11.2		454	90.8	-18.6		422	84.4
Thallium		1000	-0.500		906	90.6	1.10		870	87.0
Tin		500	-6.10		453	90.6	-6.70		435	87.0
Titanium		500	-1.80		473	94.6	-1.90		462	92.4
Tungsten		500	-3.40		476	95.2	-3.20		464	92.8
Vanadium		500	2.20		472	94.4	3.10		463	92.6

6.7.7  
6

## Percent Solids Raw Data Summary

Page 1 of 4

Job Number: JD42497  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD42497-1 Analyzed: 06-APR-22 by BG  
ClientID: MW-608D\_0-5\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.6	g
Tare Weight	24.12	g
Dry Weight (Total)	29.07	g
Solids, Percent	76.4	%

Sample: JD42497-2 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_0-5\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	31.72	g
Tare Weight	23.45	g
Dry Weight (Total)	29.86	g
Solids, Percent	77.5	%

Sample: JD42497-3 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_5-10\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	27.92	g
Tare Weight	22.17	g
Dry Weight (Total)	25.92	g
Solids, Percent	65.2	%

Sample: JD42497-4 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_10-15\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	26.11	g
Tare Weight	20.08	g
Dry Weight (Total)	24.26	g
Solids, Percent	69.3	%

Sample: JD42497-5 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_15-20\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	36.11	g
Tare Weight	28.09	g
Dry Weight (Total)	34.69	g
Solids, Percent	82.3	%

Sample: JD42497-6 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_20-25\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	31.32	g
Tare Weight	25.32	g
Dry Weight (Total)	30.68	g
Solids, Percent	89.3	%

## Percent Solids Raw Data Summary

Page 2 of 4

Job Number: JD42497  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD42497-7 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_25-30\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	23.91	g
Tare Weight	18.57	g
Dry Weight (Total)	22.19	g
Solids, Percent	67.8	%

Sample: JD42497-8 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_30-35\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.52	g
Tare Weight	25.13	g
Dry Weight (Total)	28.71	g
Solids, Percent	66.4	%

Sample: JD42497-9 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_0-5\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	36.85	g
Tare Weight	30.34	g
Dry Weight (Total)	36.01	g
Solids, Percent	87.1	%

Sample: JD42497-10 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_5-10\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	29.2	g
Tare Weight	23.72	g
Dry Weight (Total)	27.84	g
Solids, Percent	75.2	%

Sample: JD42497-11 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_10-15\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	24.19	g
Tare Weight	18.91	g
Dry Weight (Total)	22.07	g
Solids, Percent	59.8	%

Sample: JD42497-12 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_15-20\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	26.92	g
Tare Weight	21.43	g
Dry Weight (Total)	25.46	g
Solids, Percent	73.4	%

## Percent Solids Raw Data Summary

Page 3 of 4

Job Number: JD42497  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD42497-13 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_20-25\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	31.89	g
Tare Weight	25.09	g
Dry Weight (Total)	29.5	g
Solids, Percent	64.9	%

Sample: JD42497-14 Analyzed: 06-APR-22 by BG  
ClientID: AOI7-BH-22-001\_25-30\_20220404

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	31.38	g
Tare Weight	25.41	g
Dry Weight (Total)	28.78	g
Solids, Percent	56.4	%

Sample: JD42497-15 Analyzed: 06-APR-22 by BG  
ClientID: MW-609D\_35-40\_20220405

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	33.87	g
Tare Weight	27.79	g
Dry Weight (Total)	31.77	g
Solids, Percent	65.5	%

Sample: JD42497-22 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_5-10\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	31.56	g
Tare Weight	25.14	g
Dry Weight (Total)	30.18	g
Solids, Percent	78.5	%

Sample: JD42497-23 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_10-15\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	28.35	g
Tare Weight	20.22	g
Dry Weight (Total)	26.73	g
Solids, Percent	80.1	%

Sample: JD42497-24 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_15-20\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.26	g
Tare Weight	24.11	g
Dry Weight (Total)	29.29	g
Solids, Percent	84.2	%

## Percent Solids Raw Data Summary

Page 4 of 4

Job Number: JD42497  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD42497-25 Analyzed: 11-APR-22 by BG  
ClientID: MW-608D\_20-25\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	26.77	g
Tare Weight	18.88	g
Dry Weight (Total)	25.77	g
Solids, Percent	87.3	%

Sample: JD42497-26 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_25-30\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	36.6	g
Tare Weight	27.72	g
Dry Weight (Total)	34.85	g
Solids, Percent	80.3	%

Sample: JD42497-27 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_30-35\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	28.3	g
Tare Weight	22.82	g
Dry Weight (Total)	26.45	g
Solids, Percent	66.2	%

Sample: JD42497-29 Analyzed: 11-APR-22 by BG  
ClientID: MW-608D\_15-20\_FD\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	29.8	g
Tare Weight	22.36	g
Dry Weight (Total)	28.76	g
Solids, Percent	86	%

Sample: JD42497-30 Analyzed: 10-APR-22 by BG  
ClientID: MW-608D\_35-40\_20220406

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	29.56	g
Tare Weight	22.63	g
Dry Weight (Total)	27.4	g
Solids, Percent	68.8	%

**B.     SDG JD44648**



## Sample Summary

Sunoco/Evergreen

Job No: JD44648

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type		Client Sample ID
JD44648-1	05/11/22	13:20	CSS	05/11/22	SO Soil	✓	MW-559D_0-5_20220511
JD44648-2	05/11/22	13:25	CSS	05/11/22	SO Soil	✓	MW-559D_5-10_20220511
JD44648-3	05/11/22	13:30	CSS	05/11/22	SO Soil	✓	MW-559D_10-15_20220511
JD44648-4	05/11/22	13:35	CSS	05/11/22	SO Soil	✓	MW-559D_15-20_20220511
JD44648-5	05/11/22	13:40	CSS	05/11/22	SO Soil	✓	MW-559D_20-25_20220511
JD44648-6	05/11/22	13:45	CSS	05/11/22	SO Soil	✓	MW-559D_25-30_20220511
JD44648-7	05/11/22	09:30	CSS	05/11/22	SO Soil	✓	MW-560D_0-5_20220511
JD44648-8	05/11/22	09:35	CSS	05/11/22	SO Soil	✓	MW-560D_5-10_20220511
JD44648-9	05/11/22	09:40	CSS	05/11/22	SO Soil	✓	MW-560D_10-15_20220511
JD44648-10	05/11/22	09:45	CSS	05/11/22	SO Soil	✓	MW-560D_15-20_20220511
JD44648-11	05/11/22	09:50	CSS	05/11/22	SO Soil	✓	MW-560D_20-25_20220511
JD44648-12	05/11/22	09:55	CSS	05/11/22	SO Soil	✓	MW-560D_25-30_20220511

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

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**Client:** Sunoco/Evergreen

**Job No** JD44648

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 5/17/2022 3:33:35 PM

On 05/11/2022, 12 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD44648 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

<b>Matrix:</b> SO	<b>Batch ID:</b> MP32820
-------------------	--------------------------

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD44648-7SDL, JD44648-7MSD were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Iron are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for MSD for Arsenic, Iron are outside control limits for sample MP32820-S2. High rpd due to possible sample nonhomogeneity.
- JD44648-7 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-1 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-2 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-4 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-6 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-8 for Arsenic: Elevated detection limit due to dilution required for high interfering element.
- JD44648-11 for Arsenic: Elevated detection limit due to dilution required for high interfering element.

### General Chemistry By Method SM2540 G 18TH ED MOD

<b>Matrix:</b> SO	<b>Batch ID:</b> GN29099
-------------------	--------------------------

- Sample(s) JD44648-1DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Tuesday, May 17, 2022

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## CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL 732-329-0200 FAX 732-329-3499

Please merge with SDG

<b>Company Name</b> Sanborn Head & Associates		<b>Project Name</b> Evergreen Marcus Hook		<b>Main Use ONLY</b> DW - Drinking Water GW - Ground Water WW - Wastes SW - Surface Water SO - Soil SL - Sludge/SEB Sediment Oil - Oil LQ - Other Liquid AIR At SOL - Other Solid VP Wpc PB-Field Blank E.B. Equipment Blank RD- Rinsate Blank TB Ing Blank															
<b>Street Address</b> 1015 Virginia Dr, Suite 100 City: <u>                    </u> State: <u>          </u> Zip: <u>          </u> For Washington, PA, 19034		<b>Client Address</b> 4862-04 City: <u>                    </u> State: <u>          </u> Zip: <u>          </u> Concord, NH, 03301		<b>Billing Information (if different from Report to)</b> Company Name: <u>Sanborn Head &amp; Associates</u> Street Address: <u>20 Foundry Street</u> City: <u>                    </u> State: <u>          </u> Zip: <u>          </u> Concord, NH, 03301															
<b>Project Contact</b> Shana Whitney      swhitney@sanbornhead.com		<b>Client Purchase Order #</b> 603-415-6159		<b>Project Manager</b> Chelsey Shepsko															
<b>Phone #</b> 603-415-6159		<b>Project Manager</b> Chelsey Shepsko		<b>Accurate Payable</b> Chelsey Shepsko - chelshe@sanbornhead.com															
<b>Sample(s) Name(s)</b> Chelsey Shepsko      732-858-8592		<b>Project Manager</b> Chelsey Shepsko		<b>Accurate Payable</b> Chelsey Shepsko - chelshe@sanbornhead.com															
<b>Lab Sample</b> Field ID / Point of Collection		<b>MECHD Vial #</b>		<b>Date</b>		<b>Time</b>		<b>Sampled by</b>		<b>Matrix</b>		<b># of bottles</b>		<b>Number of personnel bottles</b>		<b>Total Arsenic and Iron by USEPA 6010</b>			
1 MW-559D 0-5 20220511		05/11/22		13:20		(2) SO		1		1		1		1		X			
2 MW-559D 5-10 20220511		05/11/22		13:25		SO		1		1		1		1		X			
3 MW-559D 10-15 20220511		05/11/22		13:30		SO		1		1		1		1		X			
4 MW-559D 15-20 20220511		05/11/22		13:35		SO		1		1		1		1		X			
5 MW-559D 20-25 20220511		05/11/22		13:40		SO		1		1		1		1		X			
6 MW-559D 25-30 20220511		05/11/22		13:45		SO		1		1		1		1		X			
7 MW-560D 0-5 20220511		05/11/22		09:30		SO		1		1		1		1		X			
8 MW-560D 5-10 20220511		05/11/22		09:35		SO		1		1		1		1		X			
9 MW-560D 10-15 20220511		05/11/22		09:40		SO		1		1		1		1		X			
10 MW-560D 15-20 20220511		05/11/22		09:45		SO		1		1		1		1		X			
11 MW-560D 20-25 20220511		05/11/22		09:50		SO		1		1		1		1		X			
12 MW-560D 25-30 20220511		05/11/22		09:55		SO		1		1		1		1		X			
MW-608D 0-5 202204		05/11/22		09:55		SO		1		1		1		1		X			
MW-608D 5-10 202204		05/11/22		09:55		SO		1		1		1		1		X			
MW-608D 10-15 202204		05/11/22		09:55		SO		1		1		1		1		X			
<b>Emergency &amp; Rush T/A date available via LabLink</b>		<b>Approved by (SGS Project Manager) (Date):</b>		<b>Commercial "A" (Level 1)</b> Commercial "B" (Level 2) FULLT (Level 3+)		<b>NYASP Category A</b> NYASP Category B State Forms		<b>Comments / Special Instructions</b>		<b>Emergency &amp; Rush T/A date available via LabLink</b>		<b>Approved by (SGS Project Manager) (Date):</b>		<b>Commercial "A" (Level 1)</b> Commercial "B" (Level 2) FULLT (Level 3+)		<b>NYASP Category A</b> NYASP Category B State Forms		<b>Comments / Special Instructions</b>	
<b>Emergency &amp; Rush T/A date available via LabLink</b>		<b>Approved by (SGS Project Manager) (Date):</b>		<b>Commercial "A" (Level 1)</b> Commercial "B" (Level 2) FULLT (Level 3+)		<b>NYASP Category A</b>													

## 5.1

Initial Assessment AG 2A  
Label Verification \_\_\_\_\_

Sanborn, Head &amp; Associates, Inc.

**JD44648: Chain of Custody**  
**Page 1 of 2**

## SGS Sample Receipt Summary

**Job Number:** JD44648      **Client:** SANBORN HEAD & ASSOCIATES, INC.      **Project:** SANHPAFW: MARCUS HOOK, PA  
**Date / Time Received:** 5/11/2022 4:41:00 PM      **Delivery Method:** SGS      **Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.5);  
**Cooler Temps (Corrected) °C:** Cooler 1: (2.2);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Cooler temp verification:	IR Gun
3. Cooler media:	Ice (Bag)
4. No. Coolers:	1

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Test Strip Lot #s:**      pH 1-12: 231619      pH 12+: 203117A      Other: (Specify)

Comments

SM089-03  
 Rev Date 12/7/17

**JD44648: Chain of Custody**  
**Page 2 of 2**

## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name: Evergreen Resources Group  
 Site/Project Name: SANHPAFW: Marcus Hook, PA  
 Job Number/Task/Subtask: 4862.04  
 Laboratory/Location: SGS / Dayton, NJ  
 SDG: JD44648  
 Sample Collection Dates: May 11, 2022

EnvStd Project Manager: Ammie Martin  
 Reviewed by: Tom Weinmann  
 Approved by: Ammie Martin  
 Completion Date: 06/2022  
 Validation Level: 2B

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

Parameter/ Method	Criteria Examined in Detail							Problems Identified						
	<b>Note:</b> All items examined have been included in the Support Document unless otherwise noted.													
	Check (✓) if Yes or Footnote Letter for Comments Below													
	6010D							6010D						
Condition upon Receipt	✓													
Sample Preservation	✓													
Holding Times	✓													
Blank Analysis Results	✓													
Laboratory Control Sample	✓													
Matrix Spike (Pre-Digestion Spike)	✓							✓						
Laboratory Duplicate														
Field Duplicate	✓													
Total vs. Dissolved Results Comparison														
Sample Preparation	✓													
Mass Tuning														
Initial Calibrations	✓													
Continuing Calibrations	✓													
Detection Limit/Reporting Limit Standards	✓													
Negative Bias	✓													
Interference Checks	✓													
Post-Digestion Spike														
Serial Dilution	✓													
Analytical Sequence	✓													
Linear Range Analysis														
Interelement Correction Factors														
Detection Limit/Sensitivity	✓													
Dilutions	✓													
Internal Standard Performance														
Quantitation of Results														
Multiple Exposures %RSD														
Percent Solids	✓													
Deliverable was Complete	✓													
Others:														

**Comments:** Quantitation of Results and Multiple Exposures are not included in the Support Documentation unless a problem was identified.

# Project Checklist Form

IMS Form 001



## Flat File Validation Checklist

Main fields in flat file that may change

result_text	√	detected value becomes non-detect, remove value in this field and highlight red, otherwise leave as is	THW 5/31/22
result_numeric	√	detected value becomes non-detect, remove value in this field and highlight red, otherwise leave as is	THW 5/31/22
reporting_detection_limit	√	does this value change? If so, change and highlight red, if not, leave as is	THW 5/31/22
method_detection_limit	√	check for correct limit, if this changes, highlight red, if not, leave as is	THW 5/31/22
quantitation_limit	√	check for correct limit, if this changes, highlight red, if not, leave as is	THW 5/31/22
detect_flag	√	detected value to become non-detect, change from Y to N and highlight red, otherwise leave as is	THW 5/31/22
validator_qualifiers	√	apply appropriate validation qualifiers in this field	THW 5/31/22
interpreted_qualifiers	√	copy validator_qualifiers and any lab_qualifiers that may remain to be reported (this is the final, reportable qualifier)	THW 5/31/22
reportable_result	√	if validation results in result to become not reportable, change from "Yes" to "No"	THW 5/31/22
approval_code	√	change approval code to SH-USB	THW 5/31/22
approval_a	√	apply appropriate reason code, one per field, first code here (See Validation Codes tab)	THW 5/31/22
approval_b	√	apply appropriate reason code, one per field, second code here (See Validation Codes tab)	THW 5/31/22
approval_c	√	apply appropriate reason code, one per field, third code here (See Validation Codes tab)	THW 5/31/22
approval_d	√	apply appropriate reason code, one per field, fourth code here (See Validation Codes tab)	THW 5/31/22
validated_yn	√	change from "N" to "Y" for applicable validations (individual records)	THW 5/31/22

## Report of Analysis

Client Sample ID: MW-559D\_0-5\_20220511

Lab Sample ID: JD44648-1

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 86.9

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	473	23	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	100000	580	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	MW-559D_5-10_20220511	Date Sampled:	05/11/22
Lab Sample ID:	JD44648-2	Date Received:	05/11/22
Matrix:	SO - Soil	Percent Solids:	80.9
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	422	25	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	192000	620	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-559D\_10-15\_20220511

Lab Sample ID: JD44648-3

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 60.5

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9890	32	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	50500	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-559D_15-20_20220511	Date Sampled:	05/11/22
Lab Sample ID:	JD44648-4	Date Received:	05/11/22
Matrix:	SO - Soil	Percent Solids:	83.5
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	719	23	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	158000	590	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit



## Report of Analysis

Page 1 of 1

Client Sample ID: MW-559D\_20-25\_20220511

Lab Sample ID: JD44648-5

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 64.8

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1770	6.3	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37700	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-559D\_25-30\_20220511

Lab Sample ID: JD44648-6

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 87.6

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	12.2	4.7	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	31300	120	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID:	MW-560D_0-5_20220511	Date Sampled:	05/11/22
Lab Sample ID:	JD44648-7	Date Received:	05/11/22
Matrix:	SO - Soil	Percent Solids:	76.4
Project:	SANHPAFW: Marcus Hook, PA		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	239	13	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	47000	330	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-560D\_5-10\_20220511

Lab Sample ID: JD44648-8

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 71.7

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	2890	15	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	101000	360	mg/kg	5	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-560D\_10-15\_20220511

Lab Sample ID: JD44648-9

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 67.0

Project: SANHPAFW: Marcus Hook, PA

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6940	30	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16300	75	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit

Report of Analysis

Client Sample ID:	MW-560D_15-20_20220511	Date Sampled:	05/11/22
Lab Sample ID:	JD44648-10	Date Received:	05/11/22
Matrix:	SO - Soil	Percent Solids:	62.1
Project:	SANHPAFW: Marcus Hook, PA		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10800	34	mg/kg	10	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	30500	84	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393  
(2) Prep QC Batch: MP32820

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	MW-560D_20-25_20220511	Date Sampled:	05/11/22
Lab Sample ID:	JD44648-11	Date Received:	05/11/22
Matrix:	SO - Soil	Percent Solids:	64.9
Project:	SANHPAFW: Marcus Hook, PA		

4.11

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	488	6.3	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	37900	160	mg/kg	2	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

## Report of Analysis

Page 1 of 1

Client Sample ID: MW-560D\_25-30\_20220511

Lab Sample ID: JD44648-12

Matrix: SO - Soil

Date Sampled: 05/11/22

Date Received: 05/11/22

Percent Solids: 80.6

Project: SANHPAFW: Marcus Hook, PA

4.12

4

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	105	2.5	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Iron	16900	61	mg/kg	1	05/14/22	05/16/22 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA52393

(2) Prep QC Batch: MP32820

RL = Reporting Limit



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:50	MA52393-STD1	1		STDA
06:55	MA52393-STD2	1		STDB
07:00	MA52393-ICV1	1		
07:08	MA52393-ICB1	1		
07:13	ZZZZZZ	1		
07:24	MA52393-ICCV1	1		
07:44	MA52393-CCB1	1		
07:48	MA52393-CRI1	1		
07:53	MA52393-CRID1	1		
07:58	MA52393-ICSA1	1		
08:04	MA52393-ICSAB1	1		
08:09	MA52393-HSTD1	1		
08:14	MA52393-HSTD2	1		
08:20	ZZZZZZ	1		
08:25	ZZZZZZ	1		
08:30	ZZZZZZ	1		
08:35	MA52393-CCV1	1		
08:40	MA52393-CCB2	1		
08:45	MP32820-MB1	1		
08:50	MP32820-B1	1		
08:55	MP32820-S1	1		
09:01	MP32820-S2	1		
09:06	JD44648-7	1		
09:12	MP32820-SD1	5		
09:16	MP32820-PS1	1		
09:22	JD44648-1	1		
09:27	JD44648-2	1		
09:33	MA52393-CCV2	1		
09:38	MA52393-CCB3	1		
09:43	JD44648-3	1		
09:48	JD44648-4	1		
09:53	JD44648-5	1		
09:59	JD44648-6	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:03	JD44648-8	1		
10:09	JD44648-9	1		Fe
10:14	JD44648-10	1		Fe
10:19	JD44648-11	1		
10:24	JD44648-12	1		
10:29	MA52393-CCV3	1		
10:34	MA52393-CCB4	1		
10:39	ZZZZZZ	1		
10:44	MP32820-S1	5		
10:49	MP32820-S2	5		
10:54	JD44648-7	5		
10:58	MP32820-SD1	25		
11:03	MP32820-PS1	5		
11:08	JD44648-1	10		
11:13	JD44648-2	10		
11:18	JD44648-3	2		Fe
11:23	MA52393-CCV4	1		
11:28	MA52393-CCB5	1		
11:33	JD44648-4	10		
11:38	JD44648-5	2		
11:43	JD44648-6	2		
11:48	JD44648-8	5		
11:52	JD44648-9	5		
11:57	JD44648-10	10		As
12:02	JD44648-11	2		
12:07	JD44648-3	10		As
12:12	JD44648-9	10		As
----->	Last reportable sample/prep for job JD44648			
12:17	MA52393-CCV5	1		
12:22	MA52393-CCB6	1		
12:27	MA52393-CRI2	1		
12:32	MA52393-ICSA2	1		
12:37	MA52393-ICSAB2	1		
12:43	MA52393-CCV6	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As, Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Dilution PS Factor	Recov	Comments
12:48	MA52393-CCB7	1		
	Last reportable CCB for job JD44648			
12:53	ZZZZZZ	1		
12:58	ZZZZZZ	1		
13:03	ZZZZZZ	1		
13:08	ZZZZZZ	1		
13:13	ZZZZZZ	1		
13:18	ZZZZZZ	1		
13:24	ZZZZZZ	1		
13:29	ZZZZZZ	5		
13:34	ZZZZZZ	10		
13:39	ZZZZZZ	5		
13:44	MA52393-CCV7	1		
13:49	MA52393-CCB8	1		
13:54	ZZZZZZ	1		
13:59	MP32810-S1	2		
14:04	MP32810-S2	2		
14:08	MP32810-PS1	1		ZN still out
14:14	ZZZZZZ	5		
14:19	ZZZZZZ	2		
14:24	ZZZZZZ	5		
14:28	ZZZZZZ	5		
14:33	ZZZZZZ	5		
14:39	MA52393-CCV8	1		
14:44	MA52393-CCB9	1		
14:49	ZZZZZZ	2		
14:54	ZZZZZZ	2		
14:59	ZZZZZZ	2		
15:04	ZZZZZZ	1		
15:09	ZZZZZZ	1		
15:14	MP32809-S1	2		
15:19	MP32809-S2	2		
15:24	JD44536-15	2		(sample used for QC only; not part of login JD44648)
15:29	MP32809-SD1	10		

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
 Analyst: ND  
 Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52393

Time	Sample Description	Element: Dilution	P e
07:00	MA52393-ICV1	1	X
07:08	MA52393-ICB1	1	X
07:13	ZZZZZZ	1	
07:24	MA52393-ICCV1	1	X
07:44	MA52393-CCB1	1	X
07:48	MA52393-CRI1	1	X
07:53	MA52393-CRID1	1	X
07:58	MA52393-ICSA1	1	X
08:04	MA52393-ICSAB1	1	X
08:09	MA52393-HSTD1	1	X
08:14	MA52393-HSTD2	1	X
08:20	ZZZZZZ	1	
08:25	ZZZZZZ	1	
08:30	ZZZZZZ	1	
08:35	MA52393-CCV1	1	X
08:40	MA52393-CCB2	1	X
08:45	MP32820-MB1	1	X
08:50	MP32820-B1	1	X
08:55	MP32820-S1	1	
09:01	MP32820-S2	1	
09:06	JD44648-7	1	
09:12	MP32820-SD1	5	
09:16	MP32820-PS1	1	
09:22	JD44648-1	1	
09:27	JD44648-2	1	
09:33	MA52393-CCV2	1	X
09:38	MA52393-CCB3	1	X
09:43	JD44648-3	1	
09:48	JD44648-4	1	
09:53	JD44648-5	1	
09:59	JD44648-6	1	
10:03	JD44648-8	1	
10:09	JD44648-9	1	X
		Element: Dilution	P e

REPORTED ELEMENTS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Element: Dilution	F e
10:14	JD44648-10	1	X
10:19	JD44648-11	1	
10:24	JD44648-12	1	X X
10:29	MA52393-CCV3	1	X X
10:34	MA52393-CCB4	1	X X
10:39	ZZZZZZ	1	
10:44	MP32820-S1	5	X X
10:49	MP32820-S2	5	X X
10:54	JD44648-7	5	X X
10:58	MP32820-SD1	25	X X
11:03	MP32820-PS1	5	
11:08	JD44648-1	10	X X
11:13	JD44648-2	10	X X
11:18	JD44648-3	2	X X
11:23	MA52393-CCV4	1	X X
11:28	MA52393-CCB5	1	X X
11:33	JD44648-4	10	X X
11:38	JD44648-5	2	X X
11:43	JD44648-6	2	X X
11:48	JD44648-8	5	X X
11:52	JD44648-9	5	
11:57	JD44648-10	10	X
12:02	JD44648-11	2	X X
12:07	JD44648-3	10	X
12:12	JD44648-9	10	X
12:17	MA52393-CCV5	1	X X
12:22	MA52393-CCB6	1	X X
12:27	MA52393-CRI2	1	X X
12:32	MA52393-ICSA2	1	X X
12:37	MA52393-ICSAB2	1	X X
12:43	MA52393-CCV6	1	X X
12:48	MA52393-CCB7	1	X X
12:53	ZZZZZZ	1	
		Element: Dilution	F e

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
 Analyst: ND  
 Parameters: As, Fe

Date Analyzed: 05/16/22  
 Run ID: MA52393

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:50	MA52393-STD1	5021 R	236200 R	40389 R	11370 R
06:55	MA52393-STD2	4802	222510	40117	10102
07:00	MA52393-ICV1	4911	227820	40091	10418
07:08	MA52393-ICB1	5011	237070	40522	11365
07:13	ZZZZZZ	4973	234870	40312	11139
07:24	MA52393-ICCV1	4902	229190	40303	10425
07:44	MA52393-CCB1	4990	237890	40558	11327
07:48	MA52393-CRI1	4968	235420	40186	11149
07:53	MA52393-CRID1	4993	236320	40473	11285
07:58	MA52393-ICSA1	4598	210440	39657	9422
08:04	MA52393-ICSAB1	4589	210570	39501	9411
08:09	MA52393-HSTD1	4860	231770	40366	11006
08:14	MA52393-HSTD2	4585	210430	38892	9373
08:20	ZZZZZZ	5016	234770	40567	11507
08:25	ZZZZZZ	4965	236050	40696	11550
08:30	ZZZZZZ	4998	235930	40141	11320
08:35	MA52393-CCV1	4887	228390	40072	10404
08:40	MA52393-CCB2	4995	237300	40053	11319
08:45	MP32820-MB1	5056	238550	40994	11442
08:50	MP32820-B1	4955	233280	40589	10705
08:55	MP32820-S1	5324	246420	46439	10666
09:01	MP32820-S2	5346	245790	45700	10715
09:06	JD44648-7	5378	247120	45102	10961
09:12	MP32820-SD1	5111	239300	41282	11119
09:16	MP32820-PS1	5270	242700	44581	10756
09:22	JD44648-1	No results reported for the elements associated with this internal standard.			
09:27	JD44648-2	No results reported for the elements associated with this internal standard.			
09:33	MA52393-CCV2	4862	229190	39233	10413
09:38	MA52393-CCB3	4963	235080	38985	11325
09:43	JD44648-3	No results reported for the elements associated with this internal standard.			
09:48	JD44648-4	No results reported for the elements associated with this internal standard.			
09:53	JD44648-5	No results reported for the elements associated with this internal standard.			
09:59	JD44648-6	No results reported for the elements associated with this internal standard.			

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPATW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:03	JD44648-8	No results reported for the elements associated with this internal standard.			
10:09	JD44648-9	5185	236050	42088	10553 ✓
10:14	JD44648-10	5314	244800	43195	10838 ✓
10:19	JD44648-11	No results reported for the elements associated with this internal standard.			
10:24	JD44648-12	5439	244640	43353	10922 ✓
10:29	MA52393-CCV3	4900	228510	39902	10408
10:34	MA52393-CCB4	5039	234870	39455	11394
10:39	ZZZZZZ	5283	239910	41834	11060
10:44	MP32820-S1	5204	235090	41713	10919
10:49	MP32820-S2	5212	235700	41320	11042
10:54	JD44648-7	5185	235760	40968	11148 ✓
10:58	MP32820-SD1	5150	235200	39977	11252
11:03	MP32820-PS1	5157	236370	40906	11055
11:08	JD44648-1	5125	236850	40565	11215 ✓
11:13	JD44648-2	5078	235220	40137	11298 ✓
11:18	JD44648-3	5235	240870	42564	10700 ✓
11:23	MA52393-CCV4	4982	228900	39469	10549
11:28	MA52393-CCB5	5120	236830	39906	11496
11:33	JD44648-4	5060	233660	40454	11170 ✓
11:38	JD44648-5	5218	237660	41530	10885 ✓
11:43	JD44648-6	5278	242340	41785	11237 ✓
11:48	JD44648-8	5150	235760	40816	11206 ✓
11:52	JD44648-9	5147	234300	40332	11054
11:57	JD44648-10	5130	236940	40317	11256 ✓
12:02	JD44648-11	5290	240350	42072	10968 ✓
12:07	JD44648-3	5137	236570	40690	11143 ✓
12:12	JD44648-9	5169	236130	40531	11212 ✓
12:17	MA52393-CCV5	4977	226980	39431	10516
12:22	MA52393-CCB6	5067	234790	39810	11399
12:27	MA52393-CRI2	5030	232450	39346	11200
12:32	MA52393-ICSA2	4628	208780	38723	9435
12:37	MA52393-ICSAB2	4631	207450	38655	9436
12:43	MA52393-CCV6	4998	227760	39981	10521

## INTERNAL STANDARD SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52393

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:48	MA52393-CCB7	5112	234660	40152	11447
12:53	ZZZZZZ	5287	235360	42609	10992
12:58	ZZZZZZ	5358	238560	42411	10935
13:03	ZZZZZZ	5319	239110	41968	10926
13:08	ZZZZZZ	5327	240380	42274	10933
13:13	ZZZZZZ	5347	238210	42722	10931
13:18	ZZZZZZ	5486	246480	44004	10997
13:24	ZZZZZZ	5149	999999 !	40526	11616
13:29	ZZZZZZ	4876	223630	39316	10358
13:34	ZZZZZZ	4857	221700	39387	10315
13:39	ZZZZZZ	4702	215050	39025	9853
13:44	MA52393-CCV7	4972	225160	39658	10456
13:49	MA52393-CCB8	5064	234540	39780	11333
13:54	ZZZZZZ	5142	234240	40837	11524
13:59	MP32810-S1	5037	227520	40446	10513
14:04	MP32810-S2	5097	230760	40643	10760
14:08	MP32810-PS1	No results reported for the elements associated with this internal standard.			
14:14	ZZZZZZ	5241	234310	41478	10919
14:19	ZZZZZZ	5234	231820	41770	10862
14:24	ZZZZZZ	5136	233370	40560	11007
14:28	ZZZZZZ	5102	231380	40581	10876
14:33	ZZZZZZ	5181	231900	40825	10987
14:39	MA52393-CCV8	4965	225970	39821	10439
14:44	MA52393-CCB9	5092	231490	39677	11381
14:49	ZZZZZZ	5138	232210	41416	10933
14:54	ZZZZZZ	5133	230770	41426	10528
14:59	ZZZZZZ	5036	228320	41126	10324
15:04	ZZZZZZ	5109	235670	40381	11404
15:09	ZZZZZZ	4999	227370	40279	10670
15:14	MP32809-S1	5095	230210	40897	10853
15:19	MP32809-S2	5087	229200	40695	10873
15:24	JD44536-15	5120	229360	41081	10960
15:29	MP32809-SD1	5150	231710	40312	11204



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
QC Limits: result < RL

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			07:08 ICB1		07:44 CCB1		08:40 CCB2		09:38 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.900	<3.0	-0.900	<3.0	0.400	<3.0	-0.500	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1								
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	1.30	<100	1.80	<100	4.40	<100	21.1	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3								
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

No impact

6.1.3  
6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
QC Limits: result < RL

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:		10:34 CCB4		11:28 CCB5		12:22 CCB6		12:48 CCB7		
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	27	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.3	0.200	<3.0	0.200	<3.0	-0.500	<3.0	0.200	<3.0
Barium	200	1	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.1								
Boron	100	1								
Cadmium	3.0	.2	anr							
Calcium	5000	7.7	anr							
Cerium	100									
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	6.8	anr							
Iron	100	15	8.90	<100	3.30	<100	1.90	<100	4.20	<100
Lead	3.0	1.6	anr							
Lithium	50	3.7								
Magnesium	5000	54	anr							
Manganese	15	.1	anr							
Molybdenum	20	.5								
Nickel	10	.3	anr							
Phosphorus	50	1.8								
Potassium	10000	77	anr							
Selenium	10	2	anr							
Silicon	200	1.3								
Silver	10	.9	anr							
Sodium	10000	23	anr							
Strontium	10	.4								
Sulfur	50	4.1								
Thallium	10	1.6	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	2								
Vanadium	50	.8	anr							

6.1.3  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHFAFW: Marcus Hook, PA

File ID: SP051622M1.ICP  
QC Limits: to % Recovery

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:	07:24		
Sample ID:	ICCV	ICCVI	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1990	99.5
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	39100	97.8
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time:		07:00		08:35		09:33	
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	2000	2090	104.5	2000	1990	99.5	2000
Barium	anr						1960
Beryllium	anr						98.0
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	41500	103.8	40000	38800	97.0	40000
Lead	anr						38300
Lithium							95.8
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

6.1.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		10:29		11:23		12:17	
Sample ID:	CCV	CCV3		CCV	CCV4	CCV	CCV5
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	2000	1970	98.5	2000	1960	98.0	2000
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	37600	94.0	40000	37900	94.8	40000
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

6.1.5  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPATW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limite: 95 to 105 % Recovery      Run ID: MA52393      Units: ug/l

Time:	12:43
Sample ID:	CCV
Metal	True
	CCV6
	Results & Rec

Aluminum	anr		
Antimony	anr		
Arsenic	2000	1960	98.0 ✓
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	37700	94.3 ✓
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

6.1.5  
6

## HIGH STANDARD CHECK SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP  
QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/16/22  
Run ID: MA52393

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time:		08:09		08:14	
Sample ID:	HSTD	HSTD1	HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results % Rec
Aluminum					
Antimony	anr				
Arsenic	8000	7850	98.1 ✓		
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron				200000	191000 95.5 ✓
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP Date Analyzed: 05/16/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52393 Units: ug/l

Time:	Sample ID:	CRI	CRIA	CRID	07:48:	07:53:	12:27:		
		True	True	True	CR11	CR1D1	CR12		
Metal					Results	% Rec	Results	% Rec	Results
Aluminum	200	500	100	anr					
Antimony	6.0	20	3.0	anr					
Arsenic	8.0	20	3.0	7.90	98.8	3.00	100.0	6.10	101.3
Barium	200		4.0	anr					
Beryllium	2.0		1.0	anr					
Bismuth	20								
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	1000	anr					
Cerium									
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500		106	106.0			101	101.0
Lead	3.0	20	2.5	anr					
Lithium	50								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Phosphorus	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Strontium	10								
Sulfur	50								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	anr					

6.1.7  
6



INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SD051622M1.ICP      Date Analyzed: 05/16/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52393      Units: ug/l

1.3

Time:	Sample ID:	ICSA	ICSAB	07:58	08:04	12:32	12:37	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	488000	97.6	500000	100.0	460000	92.0
Antimony		1000	-1.90		1000	100.0	-1.10	
Arsenic		1000	-0.800		997	99.7	2.20	
Barium		500	-45.3		451	90.2	-42.7	
Beryllium		500	0.400		480	96.0	0.300	
Bismuth		500	0.700		485	97.0	-1.20	
Boron		500	-2.50		468	93.6	-4.00	
Cadmium		1000	0.00		998	99.8	-0.300	
Calcium	400000	400000	387000	96.8	394000	98.5	368000	92.0
Cerium			52.4		525*		53.7	
Chromium		500	2.30		470	94.0	2.30	
Cobalt		500	0.600		461	92.2	0.300	
Copper		500	-7.10		489	97.8	-9.99	
Iron	200000	200000	197000	98.5	198000	99.0	188000	94.0
Lead		1000	0.300		918	91.8	0.500	
Lithium		500	3.40		561	112.2	4.80	
Magnesium	500000	500000	499000	99.8	489000	97.8	475000	95.0
Manganese		500	0.500		498	99.6	0.00	
Molybdenum		500	-2.90		467	93.4	-3.30	
Nickel		1000	2.10		913	91.3	1.50	
Phosphorus		500	-8.20		460	92.0	-9.10	
Potassium			-44.3		-28.8		-46.3	
Selenium		1000	2.00		921	92.1	-9.70	
Silicon		500	-22.6		445	89.0	-20.0	
Silver		1000	1.40		1020	102.0	-4.80	
Sodium			-98.6		-104		-139	
Strontium		500	0.800		496	99.2	0.700	
Sulfur		500	8.10		493	98.6	-2.00	
Thallium		1000	0.300		933	93.3	2.10	
Tin		500	-4.50		454	90.8	-4.70	
Titanium		500	-1.10		474	94.8	-1.50	
Tungsten		500	1.40		486	97.2	0.100	
Vanadium		500	-12.5		466	93.2	-11.2	

6.1.8

6

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/14/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	2.7	8.1		
Antimony	2.0	.22	.41		
Arsenic	2.0	.13	.28	0.70	<2.0
Barium	20	.1	1.9		
Beryllium	0.20	.02	.08		
Bismuth	2.0	.21	.52		
Boron	10	.1	3.7		
Cadmium	0.50	.02	.07		
Calcium	500	.77	21		
Chromium	1.0	.05	.37		
Cobalt	5.0	.04	.28		
Copper	2.5	.68	.84		
Iron	50	1.5	19	13.1	<50
Lead	2.0	.16	.41		
Lithium	5.0	.37	.92		
Magnesium	500	5.4	14		
Manganese	1.5	.01	.41		
Molybdenum	2.0	.05	.32		
Nickel	4.0	.03	.35		
Phosphorus	20	.18	3.3		
Potassium	1000	7.7	32		
Selenium	2.0	.2	.65		
Silicon	20	.13	11		
Silver	0.50	.09	.17		
Sodium	1000	2.3	78		
Strontium	5.0	.04	.18		
Sulfur	10	.41	3.9		
Thallium	1.0	.16	.58		
Tin	20	.09	3.8		
Titanium	1.0	.09	.34		
Tungsten	5.0	.2	1.8		
Vanadium	5.0	.08	.19		
Zinc	5.0	.02	2.3		

No impact

6.2.1  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNCCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7 Original MS	Spikelet MFSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	239 880	262	244.9N(a)	75-125
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	47000 79400	3270	990.1(b)	75-125
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

> 4x

6.2.2  
6

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNCROSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: mg/kg

Prep Date: 05/14/22

Metal	JD44648-7 Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	239	543	262	116.1	45.2 (A)	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	47000	62500	3270	473.7 (b)	23.8 (a)	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					
Zinc	anr					
Zirconium						

> 4x

6.2.2  
6

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD44648  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
Matrix Type: SOLID

Methods: SW846 6010D  
Units: mg/kg

Prep Date: 05/14/22

Metal	BSP Result	Spikelet MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	192	200	96.0	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	2500	2500	100.0	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD44648  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP32820  
 Matrix Type: SOLID

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/14/22

JD44648-7		QC	
Metal	Original SDL 1:5	%DIF	Limits
Aluminum	anr		
Antimony	anr		
Arsenic	1830 1930	5.6	0-10
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	359000 376000	4.8	0-10
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		

6.2.4  
6

## Percent Solids Raw Data Summary

Page 1 of 2

Job Number: JD44648  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD44648-1 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_0-5\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.59	g
Tare Weight	24.96	g
Dry Weight (Total)	29.85	g
Solids, Percent	86.9	%

Sample: JD44648-2 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_5-10\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	34.48	g
Tare Weight	26.42	g
Dry Weight (Total)	32.94	g
Solids, Percent	80.9	%

Sample: JD44648-3 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_10-15\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	35.31	g
Tare Weight	28.67	g
Dry Weight (Total)	32.69	g
Solids, Percent	60.5	%

Sample: JD44648-4 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_15-20\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	34.51	g
Tare Weight	26.07	g
Dry Weight (Total)	33.12	g
Solids, Percent	83.5	%

Sample: JD44648-5 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_20-25\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	35.65	g
Tare Weight	28.17	g
Dry Weight (Total)	33.02	g
Solids, Percent	64.8	%

Sample: JD44648-6 Analyzed: 12-MAY-22 by BG  
ClientID: MW-559D\_25-30\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	32.54	g
Tare Weight	23.93	g
Dry Weight (Total)	31.47	g
Solids, Percent	87.6	%

## Percent Solids Raw Data Summary

Page 2 of 2

Job Number: JD44648  
Account: SUNOCOSS Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Sample: JD44648-7 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_0-5\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	28.62	g
Tare Weight	20.99	g
Dry Weight (Total)	26.82	g
Solids, Percent	76.4	%

Sample: JD44648-8 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_5-10\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	32.07	g
Tare Weight	23.88	g
Dry Weight (Total)	29.75	g
Solids, Percent	71.7	%

Sample: JD44648-9 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_10-15\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	26.52	g
Tare Weight	18.71	g
Dry Weight (Total)	23.94	g
Solids, Percent	67	%

Sample: JD44648-10 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_15-20\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	27.58	g
Tare Weight	19.48	g
Dry Weight (Total)	24.51	g
Solids, Percent	62.1	%

Sample: JD44648-11 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_20-25\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.57	g
Tare Weight	21.97	g
Dry Weight (Total)	27.55	g
Solids, Percent	64.9	%

Sample: JD44648-12 Analyzed: 12-MAY-22 by BG  
ClientID: MW-560D\_25-30\_20220511

Method: SM2540 G 18TH ED MOD

Wet Weight (Total)	30.86	g
Tare Weight	23.23	g
Dry Weight (Total)	29.38	g
Solids, Percent	80.6	%



**QUALITY ASSURANCE REVIEW  
OF THE GROUNDWATER SAMPLES AND AQUEOUS BLANK  
COLLECTED ON MAY 24, 25, AND 26 2022  
AT THE MARCUS HOOK INDUSTRIAL COMPLEX SITE  
IN MARCUS HOOK, PENNSYLVANIA**

July 19, 2022

Prepared for:

**EVERGREEN RESOURCES GROUP, LLC**  
2 Righter Parkway, Suite 120  
Wilmington, DE 19803

Prepared by:

**ENVIRONMENTAL STANDARDS, INC.**  
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**SANBORN, HEAD & ASSOCIATES, INC.**  
20 Foundry Street  
Concord, NH 03301

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## 1.0 Introduction

This quality assurance (QA) review is based upon a rigorous examination of all data generated from the analyses of the groundwater samples (including quality control [QC] samples and one aqueous blank) that were collected by Sanborn, Head & Associates, Inc. (Sanborn Head), on May 24, 25, and 26, 2022, at the Marcus Hook Industrial Complex Site in Marcus Hook, Pennsylvania. The samples included in this QA review are specified on Table 1.

This review has been performed with guidance from the “National Functional Guidelines for Inorganic Data Review” (US EPA, February 1994). This document specifically addresses analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods. These validation guidelines are, therefore, not completely applicable to the type of analyses and analytical protocol performed for these samples. This document has been used to aid the data reviewer in the interpretation of the QC analysis results and in the overall evaluation of the sample data deliverables. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the requirements in the analytical methods utilized by the laboratory.

Details of this QA review are presented in Section 2.0 of this report. The reported analytical results are presented as a summary of the data in Section 7.0. Data were examined to determine the usability of the analytical results and the compliance relative to the requirements specified in the published analytical method. Qualifier codes have been placed next to results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. This critical QA review identifies data quality issues for specific samples and specific evaluation criteria. The data qualifications allow the data's end-user to best understand the usability of the analytical results. Data not qualified in this report should be considered valid based on the QC criteria that have been reviewed. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories.

**TABLE 1**  
**SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW**

Field Sample Identification	Laboratory Sample Identification	Laboratory Login Number	Matrix	Date Sample Collected	Parameters Examined
MW-608D_20220524	JD45438-1F	JD45438	Aq	5/24/22	As, Fe
MW-609D_20220524	JD45438-2F	JD45438	Aq	5/24/22	As, Fe
MW-609D_20220524 MS (Matrix Spike)	JD45438-2F MS	JD45438	Aq	5/24/22	As, Fe
MW-609D_20220524 MSD (Matrix Spike Duplicate)	JD45438-2F MSD	JD45438	Aq	5/24/22	As, Fe
MW-606D_20220525	JD45493-1F	JD45493	Aq	5/25/22	As, Fe
MW-56D_20220525	JD45493-2F	JD45493	Aq	5/25/22	As, Fe
MW-531L_20220525	JD45493-3F	JD45493	Aq	5/25/22	As, Fe
MW-532L_20220525	JD45493-4F	JD45493	Aq	5/25/22	As, Fe
MW-532L_20220525 (Matrix Spike Duplicate)	JD45493-4FD	JD45493	Aq	5/25/22	As, Fe
MW-532L_20220525 (Matrix Spike)	JD45493-4FS	JD45493	Aq	5/25/22	As, Fe
MW-532L_20220525_DUP (Field Duplicate of MW-532L_20220525)	JD45493-5F	JD45493	Aq	5/25/22	As, Fe
MW-607D_20220526	JD45654-1F	JD45654	Aq	5/26/22	As, Fe
MW-560D_20220526	JD45654-2F	JD45654	Aq	5/26/22	As, Fe
MW-560D_20220526 MS (Matrix Spike)	JD45654-2F MS	JD45654	Aq	5/26/22	As, Fe
MW-560D_20220526 MSD (Matrix Spike Duplicate)	JD45654-2F MSD	JD45654	Aq	5/26/22	As, Fe
MW-559D_20220526	JD45654-3F	JD45654	Aq	5/26/22	As, Fe
EB-01_20220526 (Equipment Blank)	JD45654-4F	JD45654	Aq	5/26/22	As, Fe

## NOTES:

As - Dissolved Arsenic by SW-846 Method 6010D. (17 samples)  
 Fe - Dissolved Iron by SW-846 Method 6010D. (17 samples)  
 Aq - Aqueous.

## 2.0 Findings

Complete support documentation for this inorganic QA review is presented in Section 8.0 of this report.

Seventeen samples (including QC samples) were analyzed for dissolved inductively coupled plasma (ICP) metals (specifically, arsenic and iron) by SW-846 Method 6010D by SGS North America, Inc. of Dayton, New Jersey, and reported in Sample Delivery Groups (SDGs) JD45438, JD45493, and JD45654. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	X		
Sample Condition Upon Receipt	X		
Blank Analysis Results	X		
MS/MSD Results	X		
LCS Results	X		
Field Duplicate Precision	X		
Serial Dilution Results	X		
Detection Limits/Sensitivity	X		
Calibrations	X		
Continuing Calibrations	X		
RL Standard Recoveries	X		
ICP Interference Check Samples	X		
Linear Range Check Results	X		
Analytical Sequence	X		
Sample Preparation	X		
Sample Login	X		

Sample Login: The laboratory personnel did not document receipt of the samples by signing the "Received By" section of the Chain-of-Custody (COC) Record included in the data package for SDG JD45493.

## 3.0 Qualifier Summary

Qualification of data was not warranted.

#### 4.0 Overall Assessment

Qualification of data based upon this QA review was not warranted. The results for dissolved arsenic in all groundwater samples were above the action limit of 3 µg/L.

#### 5.0 Inorganic Data Qualifiers and Reason Codes

##### Inorganic Data Qualifiers

- U The analyte was not detected above the associated reporting limit.
- UB The analyte should be considered “not-detected” because it was observed in an associated laboratory or field blank at a similar level. The analyte was positively identified; the associated numerical value represents the concentration reported by the laboratory but may be impacted by contamination.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J- The result is an estimated quantity and should be considered biased low.
- J+ The result is an estimated quantity and should be considered biased high.
- UU The analyte was not detected above the reported sample quantitation limit; however, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The analyte was reported as detected, but sample results are unreliable due to serious analytical deficiencies. The presence or absence of the analyte cannot be verified.
- UR The analyte was reported as not detected, but the determination that the analyte was not present in the sample is unreliable due to serious analytical deficiencies. The presence or absence of the analyte cannot be verified.

Reason Code <sup>1</sup>	Description
H	Bias in sample result likely to be high
L	Bias in sample result likely to be low
I	Bias in sample result is indeterminate
EC	Result exceeds the calibration range.
HT	Holding time requirement was not met
MB	Method blank or preparation blank contamination
LCS	Laboratory control sample evaluation criteria not met
FB	Field blank contamination
RB	Rinsate blank contamination
SQL	The analysis meets all qualitative identification criteria, but the measured concentration is less than the reporting limit.
FD	Field duplicate evaluation criteria not met
TvP	Total to Partial criteria not met
RL	Reporting limit exceeds decision criteria (for non-detects)
ICV	Initial calibration verification evaluation criteria not met
CCV	Continuing calibration verification evaluation criteria not met
CCB	Continuing calibration blank contamination
PB	Preparation Blank
ICS	Interference check sample evaluation criteria not met
D	Laboratory duplicate or spike duplicate precision evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correction coefficient <u>0.995</u>
DL	Serial dilution results did not meet evaluation criteria
TUNE	Instrument performance (tuning) criteria not met
ICAL	Initial calibration evaluation criteria not met
CCAL	Continuing calibration evaluation criteria not met
SUR	Surrogate recovery outside acceptance range
MS/SD	Matrix spike/matrix spike duplicate precision criteria not met
IS	Internal standard evaluation criteria not met
LM	The PFK lock mass SICPs indicate that ion suppression evident
ID	Target compound identification criteria not met
NSR	Not selected for reporting because the result was qualified as unusable
NSDL	Not selected for reporting because diluted result was selected for reporting
NSQ	Not selected for reporting because result was lesser quality based on data validation.
NSO	Not selected for reporting because of other reason

## 6.0 Signatures

Report Prepared by,



Jacob A. Butler  
Quality Assurance Chemist

Report Reviewed by,



Ammie L. Martin  
Senior Technical Chemist/  
Project Manager

Report Reviewed and Approved by,



Rock J. Vitale, CEAC  
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Principal

### **ENVIRONMENTAL STANDARDS, INC.**

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P.O. Box 810  
Valley Forge, PA 19482-0810

(610) 935-5577

Date: 7/19/22





## **7.0 ANALYTICAL RESULTS**

Analytical Results

SDG	Laboratory Sample ID	Field Sample ID	Sample Collection Date	Sample Code	Parent Sample ID	Matrix	Analytical Method	Test Type	Fraction	CAS #	Analyte	result_text	RDL	Units	Validator Qualifier	Approval Code	DF
JD45654	JD45654-4F	EB-01_20220526	26-May-22	N		WQ	SW6010D	INITIAL	D	7440-38-2	ARSENIC	11.3	3.0	ug/L		SH-USB	1
JD45654	JD45654-4F	EB-01_20220526	26-May-22	N		WQ	SW6010D	INITIAL	D	7439-89-6	IRON		100	ug/L	U	SH-USB	1
JD45493	JD45493-3F	MW-531L_20220525	25-May-22	N		WG	SW6010D	DILUTION	D	7440-38-2	ARSENIC	202000	300	ug/L		SH-USB	100
JD45493	JD45493-3F	MW-531L_20220525	25-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	45600	100	ug/L		SH-USB	1
JD45493	JD45493-4F	MW-532L_20220525	25-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	60300	100	ug/L		SH-USB	1
JD45493	JD45493-5F	MW-532L_20220525_DUP	25-May-22	FD	MW-532L_20220525	WG	SW6010D	DILUTION	D	7440-38-2	ARSENIC	1380000	600	ug/L		SH-USB	200
JD45493	JD45493-5F	MW-532L_20220525_DUP	25-May-22	FD	MW-532L_20220525	WG	SW6010D	INITIAL	D	7439-89-6	IRON	51700	100	ug/L		SH-USB	1
JD45654	JD45654-3F	MW-559D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7440-38-2	ARSENIC	297	3.0	ug/L		SH-USB	1
JD45654	JD45654-3F	MW-559D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	41500	100	ug/L		SH-USB	1
JD45654	JD45654-2F	MW-560D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7440-38-2	ARSENIC	14600	15	ug/L		SH-USB	5
JD45654	JD45654-2F	MW-560D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	52800	500	ug/L		SH-USB	5
JD45493	JD45493-2F	MW-56D_20220525	25-May-22	N		WG	SW6010D	DILUTION	D	7440-38-2	ARSENIC	386000	600	ug/L		SH-USB	200
JD45493	JD45493-2F	MW-56D_20220525	25-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	115000	100	ug/L		SH-USB	1
JD45493	JD45493-1F	MW-606D_20220525	25-May-22	N		WG	SW6010D	INITIAL	D	7440-38-2	ARSENIC	636000	600	ug/L		SH-USB	200
JD45493	JD45493-1F	MW-606D_20220525	25-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	319000	20000	ug/L		SH-USB	200
JD45654	JD45654-1F	MW-607D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7440-38-2	ARSENIC	111000	150	ug/L		SH-USB	50
JD45654	JD45654-1F	MW-607D_20220526	26-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	56500	5000	ug/L		SH-USB	50
JD45438	JD45438-1F	MW-608D_20220524	24-May-22	N		WG	SW6010D	DILUTION	D	7440-38-2	ARSENIC	494000	600	ug/L		SH-USB	200
JD45438	JD45438-1F	MW-608D_20220524	24-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	73600	100	ug/L		SH-USB	1
JD45438	JD45438-2F	MW-609D_20220524	24-May-22	N		WG	SW6010D	DILUTION	D	7440-38-2	ARSENIC	633000	600	ug/L		SH-USB	200
JD45438	JD45438-2F	MW-609D_20220524	24-May-22	N		WG	SW6010D	INITIAL	D	7439-89-6	IRON	108000	100	ug/L		SH-USB	1

## **8.0 SUPPORTING DOCUMENTATION**

**A.     SDG JD45438**



Sample Summary

Sunoco/Evergreen

Job No: JD45438

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45438-1F	05/24/22	09:25 MF	05/24/22	AQ	Groundwater Filtered	MW-608D_20220524
JD45438-2F	05/24/22	12:00 MF	05/24/22	AQ	Groundwater Filtered	MW-609D_20220524

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45438

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/6/2022 10:35:49 AM

On 05/24/2022, 2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45438 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33185

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45438-2FMS, JD45438-2FMSD, JD45438-2FSDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

4x

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Monday, June 06, 2022

Page 1 of 1

[illegible]

## SGS Sample Receipt Summary

Job Number: JD45438

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/24/2022 6:45:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.7);

### Cooler Security

Y or N

1. Custody Seals Present:

☒ ☒ ☐

3. COC Present:

☒ ☒ ☐

2. Custody Seals Intact:

☒ ☒ ☐

4. Smpl Dates/Time OK

☒ ☒ ☐

### Cooler Temperature

Y or N

1. Temp criteria achieved:

☒ ☒ ☐

2. Cooler temp verification:

IR Gun

3. Cooler media:

Ice (Bag)

4. No. Coolers:

1

### Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler:

☐ ☒ ☒ ☐

2. Trip Blank listed on COC:

☐ ☒ ☒ ☐

3. Samples preserved properly:

☒ ☒ ☐

4. VOCs headspace free:

☐ ☐ ☒ ☒

### Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles:

☒ ☒ ☐

2. Container labeling complete:

☒ ☒ ☐

3. Sample container label / COC agree:

☒ ☒ ☐

### Sample Integrity - Condition

Y or N

1. Sample recvd within HT:

☒ ☒ ☐

2. All containers accounted for:

☒ ☒ ☐

3. Condition of sample:

Intact

### Sample Integrity - Instructions

Y or N

N/A

1. Analysis requested is clear:

☒ ☒ ☐

2. Bottles received for unspecified tests

☐ ☒ ☒

3. Sufficient volume recvd for analysis:

☒ ☒ ☐

4. Compositing instructions clear:

☐ ☐ ☒ ☒

5. Filtering instructions clear:

☐ ☐ ☒ ☒

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD45438: Chain of Custody

Page 2 of 2





Aq = Aqueous; S = Solid

Notes:

Report of Analysis

<b>Client Sample ID:</b>	MW-608D_20220524	<b>Date Sampled:</b>	05/24/22
<b>Lab Sample ID:</b>	JD45438-1F	<b>Date Received:</b>	05/24/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	494000	600	ug/l	200	06/01/22	06/02/22	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	73600	100	ug/l	1	06/01/22	06/03/22	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52505
- (2) Instrument QC Batch: MA52515
- (3) Prep QC Batch: MP33185



RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-609D_20220524	<b>Date Sampled:</b>	05/24/22
<b>Lab Sample ID:</b>	JD45438-2F	<b>Date Received:</b>	05/24/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	633000	600	ug/l	200	06/01/22	06/02/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	108000	100	ug/l	1	06/01/22	06/03/22 ND	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA52505
- (2) Instrument QC Batch: MA52515
- (3) Prep QC Batch: MP33185



RL = Reporting Limit

4.2  
4

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:37	MA52505-STD1	1		STDA
06:43	MA52505-STD2	1		STDB
06:48	MA52505-ICV1	1		
06:55	MA52505-ICB1	1		
07:01	MA52505-ICCV1	1		
07:12	MA52505-CCB1	1		
07:18	MA52505-CRI1	1		
07:23	MA52505-CRID1	1		
07:29	MA52505-ICSA1	1		
07:34	MA52505-ICSAB1	1		
07:38	MA52505-HSTD1	1		
07:44	MA52505-HSTD2	1		
07:49	MA52505-CRID2	1		
07:54	MP33185-B1	1		batch to rerun for Ag, Cu, SB,Be, CRI and ICSA out
07:59	MP33185-MB1	1		
08:04	MA52505-CCV1	1		
08:09	MA52505-CCB2	1		
08:14	MP33185-S1	200		rerun straight for FE
08:19	MP33185-S2	200		rerun straight for FE
08:24	JD45438-2F	200		rerun straight for FE
08:29	MP33185-SD1	1000		rerun straight for FE
08:34	JD45438-1F	200		rerun straight for FE
----->	Last reportable sample/prep for job JD45438			
08:40	MP33201-MB1	1		
08:45	MP33201-B1	1		
08:50	MA52505-CCV2	1		
08:55	MA52505-CCB3	1		
09:00	MP33201-S1	1		
09:05	MP33201-S2	1		
09:10	JD45638-2	1		(sample used for QC only; not part of login JD45438)
09:15	MP33201-SD1	5		
09:20	ZZZZZZ	1		
09:25	ZZZZZZ	1		
09:31	ZZZZZZ	1		

As  
only

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:36	ZZZZZZ	1		
09:41	ZZZZZZ	1		
09:46	MA52505-CCV3	1		
09:51	MA52505-CCB4	1		
09:56	MA52505-CRID3	1		
10:02	ZZZZZZ	1		
10:07	ZZZZZZ	1		
10:12	ZZZZZZ	1		
10:17	ZZZZZZ	1		
10:22	ZZZZZZ	1		
10:28	ZZZZZZ	1		
10:40	MA52505-CRI2	1		
10:46	MA52505-ICSA2	1		
10:51	MA52505-ICSAB2	1		
10:56	MA52505-CCV4	1		
11:01	MA52505-CCB5	1		
----->	Last reportable CCB for job JD45438			
11:06	ZZZZZZ	1		
11:11	ZZZZZZ	1		
11:16	ZZZZZZ	1		
11:21	ZZZZZZ	1		
11:27	ZZZZZZ	1		
11:32	ZZZZZZ	1		
11:37	ZZZZZZ	1		
11:42	ZZZZZZ	1		
11:47	ZZZZZZ	1		
11:53	MA52505-CCV5	1		
11:58	MA52505-CCB6	1		
12:03	ZZZZZZ	1		
12:08	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Element: Dilution	A F s e
06:48	MA52505-ICV1	1	X X
06:55	MA52505-ICB1	1	X X
07:01	MA52505-ICCV1	1	X X
07:12	MA52505-CCB1	1	X X
07:18	MA52505-CRI1	1	X X
07:23	MA52505-CRID1	1	
07:29	MA52505-ICSA1	1	X X
07:34	MA52505-ICSAB1	1	X X
07:38	MA52505-HSTD1	1	X X
07:44	MA52505-HSTD2	1	X X
07:49	MA52505-CRID2	1	X X
07:54	MP33185-B1	1	X X
07:59	MP33185-MB1	1	X X
08:04	MA52505-CCV1	1	X X
08:09	MA52505-CCB2	1	X X
08:14	MP33185-S1	200	X
08:19	MP33185-S2	200	X
08:24	JD45438-2F	200	X
08:29	MP33185-SD1	1000	X
08:34	JD45438-1F	200	X
08:40	MP33201-MB1	1	
08:45	MP33201-B1	1	
08:50	MA52505-CCV2	1	X X
08:55	MA52505-CCB3	1	X X
09:00	MP33201-S1	1	
09:05	MP33201-S2	1	
09:10	JD45638-2	1	(a)
09:15	MP33201-SD1	5	
09:20	ZZZZZZ	1	
09:25	ZZZZZZ	1	
09:31	ZZZZZZ	1	
09:36	ZZZZZZ	1	
09:41	ZZZZZZ	1	
		Element:	A F s e

REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Element: Dilution	A F s e
09:46	MA52505-CCV3	1	X X
09:51	MA52505-CCB4	1	X X
09:56	MA52505-CRID3	1	X X
10:02	ZZZZZZ	1	
10:07	ZZZZZZ	1	
10:12	ZZZZZZ	1	
10:17	ZZZZZZ	1	
10:22	ZZZZZZ	1	
10:28	ZZZZZZ	1	
10:40	MA52505-CRI2	1	X X
10:46	MA52505-ICSA2	1	X X
10:51	MA52505-ICSAB2	1	X X
10:56	MA52505-CCV4	1	X X
11:01	MA52505-CCB5	1	X X
11:06	ZZZZZZ	1	
11:11	ZZZZZZ	1	
11:16	ZZZZZZ	1	
11:21	ZZZZZZ	1	
11:27	ZZZZZZ	1	
11:32	ZZZZZZ	1	
11:37	ZZZZZZ	1	
11:42	ZZZZZZ	1	
11:47	ZZZZZZ	1	
11:53	MA52505-CCV5	1	X X
11:58	MA52505-CCB6	1	X X
12:03	ZZZZZZ	1	
12:08	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45438.

Element: A F s e

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22  
Run ID: MA52505  
Methods: EPA 200.7, SW846 6010D

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:37	MA52505-STD1	4072 R	132350 R	8429 R	9959 R
06:43	MA52505-STD2	3927	125460	8354	9449
06:48	MA52505-ICV1	3859	126830	8527	9277
06:55	MA52505-ICB1	4130	136660	8877	10070
07:01	MA52505-ICCV1	3969	130340	8888	9522
07:12	MA52505-CCB1	4056	132230	8624	9945
07:18	MA52505-CRI1	4113	137310	8773	10042
07:23	MA52505-CRID1	No results reported for the elements associated with this internal standard.			
07:29	MA52505-ICSA1	3781	125290	8715	9038
07:34	MA52505-ICSAB1	3752	115710	8224	8978
07:38	MA52505-HSTD1	3933	130220	8737	9743
07:44	MA52505-HSTD2	3714	124580	8656	8817
07:49	MA52505-CRID2	4029	134100	9058	9861
07:54	MP33185-B1	4000	133690	9137	9699
07:59	MP33185-MB1	4127	137210	9166	10128
08:04	MA52505-CCV1	4041	133620	9081	9754
08:09	MA52505-CCB2	4098	137430	9214	10075
08:14	MP33185-S1	4120	135770	9105	10128
08:19	MP33185-S2	4123	133510	9050	10130
08:24	JD45438-2F	4036	134550	9059	9890
08:29	MP33185-SD1	4116	137310	9142	10104
08:34	JD45438-1F	4195	134500	8904	10309
08:40	MP33201-MB1	4196	134340	9044	10307
08:45	MP33201-B1	4189	134650	9020	10170
08:50	MA52505-CCV2	4185	134120	8855	10107
08:55	MA52505-CCB3	4255	141720	9155	10444
09:00	MP33201-S1	4157	137600	9543	10063
09:05	MP33201-S2	4131	137850	9483	9991
09:10	JD45638-2	4202	140740	9612	10242
09:15	MP33201-SD1	4251	142750	9565	10444
09:20	ZZZZZZ	4169	141120	9685	10158
09:25	ZZZZZZ	4241	142620	9616	10345
09:31	ZZZZZZ	4235	141450	9562	10329



## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52505

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
09:36	ZZZZZZ	4214	132000	8801	10224
09:41	ZZZZZZ	4246	136360	9317	10337
09:46	MA52505-CCV3	4130	134750	9157	9958
09:51	MA52505-CCB4	4329	139130	9473	10646
09:56	MA52505-CRID3	4301	135050	8879	10559
10:02	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:07	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:12	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:17	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:22	ZZZZZZ	No results reported for the elements associated with this internal standard.			
10:28	ZZZZZZ	10569 !	326150 !	17370 !	25025 !
10:40	MA52505-CRI2	4207	142050	9593	10134
10:46	MA52505-ICSA2	3844	126570	9018	9060
10:51	MA52505-ICSAB2	3885	130020	9344	9155
10:56	MA52505-CCV4	4196	141160	9512	9950
11:01	MA52505-CCB5	4261	145830	9689	10289
11:06	ZZZZZZ	4310	144370	9858	10568
11:11	ZZZZZZ	3638	123620	9031	8164
11:16	ZZZZZZ	3668	123380	9030	8205
11:21	ZZZZZZ	3752	124190	9040	8373
11:27	ZZZZZZ	3659	123770	8998	8205
11:32	ZZZZZZ	3654	123110	9171	8194
11:37	ZZZZZZ	3698	125220	9158	8268
11:42	ZZZZZZ	3665	124600	9136	8211
11:47	ZZZZZZ	3676	123350	9097	8240
11:53	MA52505-CCV5	4307	144440	9788	10154
11:58	MA52505-CCB6	4420	148650	9843	10601
12:03	ZZZZZZ	4459	148690	9809	10803
12:08	ZZZZZZ	4415	147360	9819	10587

R = Reference for ISTD limits. ! = outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/02/22  
Run ID: MA52505

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			06:55 ICB1		07:12 CCB1		08:09 CCB2		08:55 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	9.2	anr							
Antimony	6.0	2.8	anr							
Arsenic	3.0	2.6	0.700	<3.0	0.900	<3.0	1.70	<3.0	0.700	<3.0
Barium	200	.2	anr	✓		✓		✓		✓
Beryllium	1.0	.2	anr			✓		✓		✓
Bismuth	20	2.5								
Boron	100	1.8								
Cadmium	3.0	.4	anr							
Calcium	5000	13	anr							
Cerium	100									
Chromium	10	.7	anr							
Cobalt	50	.6	anr							
Copper	10	.7	anr							
Iron	100	3.3	4.20	<100	1.30	<100	0.400	<100	2.60	<100
Lead	3.0	2	anr	✓		✓		✓		✓
Lithium	50	1.5		✓		✓		✓		✓
Magnesium	5000	25	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6	anr							
Nickel	10	.8	anr							
Phosphorus	50	7								
Potassium	10000	35	anr							
Selenium	10	3.6	anr							
Silicon	200	2.2								
Silver	10	.6	anr							
Sodium	10000	14	anr							
Strontium	10	.1								
Sulfur	50	3.7								
Thallium	10	5.2	anr							
Tin	10	1.4								
Titanium	10	.8								
Tungsten	50	1.3								
Vanadium	50	.5	anr							

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			06:55 ICB1		07:12 CCB1		08:09 CCB2		08:55 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.3	anr							
Zirconium	10	.5								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/02/22  
Run ID: MA52505

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			09:51 CCB4		11:01 CCB5	
Metal	RL	IDL	raw	final	raw	final
Aluminum	200	9.2	anr			
Antimony	6.0	2.8	anr			
Arsenic	3.0	2.6	1.60	<3.0	1.80	<3.0
Barium	200	.2	anr			
Beryllium	1.0	.2	anr			
Bismuth	20	2.5				
Boron	100	1.8				
Cadmium	3.0	.4	anr			
Calcium	5000	13	anr			
Cerium	100					
Chromium	10	.7	anr			
Cobalt	50	.6	anr			
Copper	10	.7	anr			
Iron	100	3.3	0.100	<100	-1.70	<100
Lead	3.0	2	anr			
Lithium	50	1.5				
Magnesium	5000	25	anr			
Manganese	15	.1	anr			
Molybdenum	20	.6	anr			
Nickel	10	.8	anr			
Phosphorus	50	7				
Potassium	10000	35	anr			
Selenium	10	3.6	anr			
Silicon	200	2.2				
Silver	10	.6	anr			
Sodium	10000	14	anr			
Strontium	10	.1				
Sulfur	50	3.7				
Thallium	10	5.2	anr			
Tin	10	1.4				
Titanium	10	.8				
Tungsten	50	1.3				
Vanadium	50	.5	anr			

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52505 Units: ug/l

Time: Sample ID:			09:51 CCB4		11:01 CCB5	
Metal	RL	IDL	raw	final	raw	final

Zinc 20 .3 anr

Zirconium 10 .5

(\*) Outside of QC limits

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery Run ID: MA52505 Units: ug/l

Time: 07:01		07:01	
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1940	97.0
Barium	anr		
Beryllium	anr		
Bismuth			
Boron			90-110
Cadmium	anr		
Calcium	anr		
Cerium			
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	40000	39300	98.3
Lead	anr		
Lithium			
Magnesium	anr		
Manganese	anr		
Molybdenum	anr		
Nickel	anr		
Phosphorus			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Sulfur			
Thallium	anr		
Tin			
Titanium			
Tungsten			
Vanadium	anr		

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: to % Recovery      Run ID: MA52505      Units: ug/l

Time:		07:01	
Sample ID:		ICCV	
Metal		True	
		Results	% Rec

Zinc                    anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time: Sample ID:		06:48 ICV1		08:04 CCV1		08:50 CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	2000	2030	101.5	2000	1910	95.5	2000
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Cerium							
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	40000	41100	102.8	40000	38500	96.3	40000
Lead	anr						
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum	anr						
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						

6.1.5  
6

90-110



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		06:48			08:04			08:50		
Sample ID:	ICV	ICV1	CCV		CCV1	CCV		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.5

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		09:46		10:56	
Sample ID:		CCV		CCV	
Metal		CCV3		CCV4	
		True	Results % Rec	True	Results % Rec
Aluminum	anr	none bracketed		none bracketed	
Antimony	anr				
Arsenic	2000	1800	90.0	2000	1820 91.0
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium	anr				
Cerium					
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	40000	38000	95.0	40000	35100 87.8*(a)
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Sulfur					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52505      Units: ug/l

Time:		09:46		10:56		
Sample ID:		CCV3		CCV4		
Metal	True	Results	% Rec	True	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52505 Units: ug/l

Time:		07:38		07:44		
Sample ID:	HSTD	HSTD1	HSTD	HSTD2	HSTD	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony	anr					
Arsenic	8000	7380	92.3			
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium						
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron				200000	191000	95.5
Lead	anr					
Lithium						
Magnesium						
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

90-110

HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52505      Units: ug/l

Time:		07:38		07:44	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.16

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:18 CRID1	07:49 CRID2	09:56 CRID3
Metal	True	True	True	Results % Rec	Results % Rec	Results % Rec
Aluminum	200	500	100	anr		
Antimony	6.0	20	3.0	anr		
Arsenic	8.0	20	3.0	9.60 120.0	3.10 103.3	3.20 106.7
Barium	200		4.0	anr		
Beryllium	2.0		1.0	anr		
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0	anr		
Calcium	5000	2000	1000	anr		
Cerium						
Chromium	10		2.0	anr		
Cobalt	50		3.0	anr		
Copper	10		2.0	anr		
Iron	100	500		106 106.0		
Lead	3.0	20	2.5	anr		
Lithium	50					
Magnesium	5000	2000	100	anr		
Manganese	15		3.0	anr		
Molybdenum	20			anr		
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000	anr		
Selenium	10	20	5.0	anr		
Silicon	200					
Silver	5.0		2.0	anr		
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0	anr		
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0	anr		

70-130

6.1.7

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time:					07:18		07:49		09:56	
Sample ID:	CRI	CRIA	CRID		CRID1		CRID2		CRID3	
Metal	True	True	True		Results	% Rec	Results	% Rec	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.7  
 6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	10:40 CRI2	% Rec
Metal	True	True	True	Results	
Aluminum	200	500	100	anr	
Antimony	6.0	20	3.0	anr	
Arsenic	8.0	20	3.0	9.30	116.3
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	anr	
Calcium	5000	2000	1000	anr	
Cerium					
Chromium	10		2.0	anr	
Cobalt	50		3.0	anr	
Copper	10		2.0	anr	
Iron	100	500		99.8	99.8
Lead	3.0	20	2.5	anr	
Lithium	50				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20			anr	
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0	anr	
Silicon	200				
Silver	5.0		2.0	anr	
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0	anr	
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	anr	



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52505 Units: ug/l

Time:				10:40	
Sample ID:	CRI	CRIA	CRID	CRI2	
Metal	True	True	True	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.7  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP      Date Analyzed: 06/02/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52505      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:29 ICSAB1 Results	% Rec	07:34 ICSAB1 Results	% Rec	10:46 ICSAB2 Results	% Rec	10:51 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	491000	98.2	492000	98.4	452000	90.4	450000	90.0
Antimony		1000	-0.400		973	97.3	1.50		917	91.7
Arsenic		1000	-2.40		949	94.9	0.00		900	90.0
Barium		500	3.30		474	94.8	3.30		439	87.8
Beryllium		500	1.00*(a)		473	94.6	0.600		443	88.6
Bismuth		500	-0.500		494	98.8	-2.20		465	93.0
Boron		500	1.10		486	97.2	0.500		450	90.0
Cadmium		1000	-1.00		97	99.7	-1.40		926	92.6
Calcium	400000	400000	382000	95.5	390000	97.5	349000	87.3	351000	87.8
Cerium			25.1		499*		26.3		476*	
Chromium		500	-1.40		474	94.8	-1.30		426	85.2
Cobalt		500	0.700		464	92.8	0.600		433	86.6
Copper		500	11.2*(a)		517	103.4	5.10		488	97.6
Iron	200000	200000	201000	100.5	198000	99.0	182000	91.0	177000	88.5
Lead		1000	1.90		915	91.5	-0.500		885	88.5
Lithium		500	1.90		466	93.2	3.80		438	87.6
Magnesium	500000	500000	486000	97.2	492000	98.4	451000	90.2	445000	89.0
Manganese		500	1.00		504	100.8	0.00		442	88.4
Molybdenum		500	1.20		459	91.8	0.600		437	87.4
Nickel		1000	0.600		900	90.0	1.30		862	86.2
Phosphorus		500	8.90		477	95.4	9.50		459	91.8
Potassium			17.0		42.3		2.00		-34.1	
Selenium		1000	-3.70		894	89.4	-8.20		837	83.7
Silicon		500	-18.0		497	99.4	-15.8		463	92.6
Silver		1000	1.70		1020	102.0	-4.00		948	94.8
Sodium			33.7		35.8		20.8		30.7	
Strontium		500	-0.900		477	95.4	-0.700		446	89.2
Sulfur		500	34.2		513	102.6	30.4		470	94.0
Thallium		1000	1.80		914	91.4	1.70		875	87.5
Tin		500	-4.20		461	92.2	-4.00		426	85.2
Titanium		500	-2.20		475	95.0	-1.90		444	88.8
Tungsten		500	-6.60		462	92.4	-4.60		430	86.0
Vanadium		500	-2.30		486	97.2	-1.40		444	88.8

6.1.8

6

80-120

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SF060222M1.ICP Date Analyzed: 06/02/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52505 Units: ug/l

Time:				07:29			07:34			10:46			10:51
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	10.1			920	92.0	9.10		882	88.2		
Zirconium		500	3.50			431	86.2	1.90		397	79.4*		

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:11	MA52515-STD1	1		STDA
12:16	MA52515-STD2	1		STDB
12:21	MA52515-ICV1	1		All Fe
12:29	MA52515-ICB1	1		
12:34	MA52515-CCV1	1		
12:38	MA52515-CCB1	1		
12:43	MA52515-CRID1	1		
12:48	MA52515-CRI1	1		
12:53	MA52515-ICSA1	1		
12:58	MA52515-ICSAB1	1		
13:03	MA52515-HSTD1	1		
13:09	MA52515-HSTD2	1		
13:16	MP33220-S1	5		
13:20	MP33220-S2	5		
13:25	ZZZZZZ	25		
13:33	MA52515-CCV2	1		
13:38	MA52515-CCB2	1		
13:43	MP33220-MB1	1		
13:48	JD45654-2F	5		(sample used for QC only; not part of login JD45438)
13:52	MP33220-SD1	25		
13:57	ZZZZZZ	50		
14:02	MP33220-B1	1		
14:07	ZZZZZZ	1		
14:12	ZZZZZZ	1		
14:18	ZZZZZZ	5		
14:23	ZZZZZZ	1		
14:28	MA52515-CCV3	1		
14:33	MA52515-CCB3	1		
14:38	MA52515-CRI2	1		
14:43	MA52515-CRID2	1		
14:48	MA52515-ICSA2	1		
14:53	MA52515-ICSAB2	1		
14:58	MP33185-S1	1		

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:04	MP33185-S2	1		
15:09	JD45438-2F	1		
15:14	MP33185-SD1	5		
15:19	ZZZZZZ	1		
15:27	MA52515-CCV4	1		
15:31	MA52515-CCB4	1		
15:36	JD45438-1F	1		
----->	Last reportable sample/	prep for job JD45438		
15:42	ZZZZZZ	1		
15:47	ZZZZZZ	1		
15:52	ZZZZZZ	1		
15:57	ZZZZZZ	1		
16:02	MA52515-CCV5	1		
16:10	MA52515-CCB5	1		
16:15	MA52515-CRI3	1		
16:20	MA52515-ICSA3	1		
16:25	MA52515-ICSAB3	1		
16:30	MA52515-CCV6	1		
16:35	MA52515-CCB6	1		
----->	Last reportable CCB for	job JD45438		
16:40	ZZZZZZ	1		
16:45	ZZZZZZ	1		
16:50	ZZZZZZ	1		
Refer to raw data for calibration curve and standards.				

# REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
 Analyst: ND  
 Parameters: Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52515

Time	Sample Description	Element: Fe Dilution	e
12:21	MA52515-ICV1	1	X
12:29	MA52515-ICB1	1	X
12:34	MA52515-CCV1	1	X
12:38	MA52515-CCB1	1	X
12:43	MA52515-CRID1	1	X
12:48	MA52515-CRI1	1	X
12:53	MA52515-ICSA1	1	X
12:58	MA52515-ICSAB1	1	X
13:03	MA52515-HSTD1	1	X
13:09	MA52515-HSTD2	1	X
13:16	MP33220-S1	5	X
13:20	MP33220-S2	5	X
13:25	ZZZZZZ	25	
13:33	MA52515-CCV2	1	X
13:38	MA52515-CCB2	1	X
13:43	MP33220-MB1	1	X
13:48	JD45654-2F	5	X (a)
13:52	MP33220-SD1	25	X
13:57	ZZZZZZ	50	
14:02	MP33220-B1	1	X
14:07	ZZZZZZ	1	
14:12	ZZZZZZ	1	
14:18	ZZZZZZ	5	
14:23	ZZZZZZ	1	
14:28	MA52515-CCV3	1	X
14:33	MA52515-CCB3	1	X
14:38	MA52515-CRI2	1	X
14:43	MA52515-CRID2	1	X
14:48	MA52515-ICSA2	1	X
14:53	MA52515-ICSAB2	1	X
14:58	MP33185-S1	1	X
15:04	MP33185-S2	1	X
15:09	JD45438-2F	1	X
		Element: Fe	e

# REPORTED ELEMENTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Analyst: ND Run ID: MA52515  
Parameters: Fe

Time	Sample Description	Element: Fe Dilution	e
15:14	MP33185-SD1	5	X
15:19	ZZZZZZ	1	
15:27	MA52515-CCV4	1	X
15:31	MA52515-CCB4	1	X
15:36	JD45438-1F	1	X
15:42	ZZZZZZ	1	
15:47	ZZZZZZ	1	
15:52	ZZZZZZ	1	
15:57	ZZZZZZ	1	
16:02	MA52515-CCV5	1	X
16:10	MA52515-CCB5	1	X
16:15	MA52515-CRI3	1	X
16:20	MA52515-ICSA3	1	X
16:25	MA52515-ICSAB3	1	X
16:30	MA52515-CCV6	1	X
16:35	MA52515-CCB6	1	X
16:40	ZZZZZZ	1	
16:45	ZZZZZZ	1	
16:50	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45438.

Element: Fe

## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:11	MA52515-STD1	5447 R	170800 R	17890 R	10639 R
12:16	MA52515-STD2	5199	161480	17783	9473
12:21	MA52515-ICV1	5276	163330	17707	9759
12:29	MA52515-ICB1	5385	170350	17903	10582
12:34	MA52515-CCV1	5337	165140	17913	9821
12:38	MA52515-CCB1	5429	170500	17947	10639
12:43	MA52515-CRID1	5422	171200	17932	10620
12:48	MA52515-CRI1	5362	168100	17734	10464
12:53	MA52515-ICSA1	4988	153240	17706	8890
12:58	MA52515-ICSAB1	4995	153440	17901	8896
13:03	MA52515-HSTD1	5410	170820	18103	10503
13:09	MA52515-HSTD2	5027	155540	17655	8915
13:16	MP33220-S1	5349	166980	17855	10138
13:20	MP33220-S2	5397	168410	18091	10205
13:25	ZZZZZZ	5437	169920	18235	10417
13:33	MA52515-CCV2	5353	166280	17762	9887
13:38	MA52515-CCB2	5455	170830	17843	10739
13:43	MP33220-MB1	5522	175690	18492	10838
13:48	JD45654-2F	5468	171220	18311	10420
13:52	MP33220-SD1	5518	172940	18198	10716
13:57	ZZZZZZ	5519	171650	18154	10782
14:02	MP33220-B1	5450	170220	18352	10221
14:07	ZZZZZZ	5010	155560	18004	9023
14:12	ZZZZZZ	5571	176380	18618	10952
14:18	ZZZZZZ	5362	167910	18242	9978
14:23	ZZZZZZ	5440	170230	18248	10820
14:28	MA52515-CCV3	5423	168050	18137	10011
14:33	MA52515-CCB3	5445	172030	17895	10746
14:38	MA52515-CRI2	5488	172200	18115	10680
14:43	MA52515-CRID2	5542	173630	18266	10847
14:48	MA52515-ICSA2	5125	155980	18158	9136
14:53	MA52515-ICSAB2	5145	156900	18112	9145
14:58	MP33185-S1	4923	155420	17956	8866



## INTERNAL STANDARD SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
 Analyst: ND  
 Parameters: Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:04	MP33185-S2	4871	154140	17715	8806
15:09	JD45438-2F	4933	154930	17970	8904
15:14	MP33185-SD1	5421	170310	18540	10072
15:19	ZZZZZZ	5482	172050	18819	10197
15:27	MA52515-CCV4	5590	173350	18743	10284
15:31	MA52515-CCB4	5574	176300	18412	10972
15:36	JD45438-1F	4867	153810	17828	8787
15:42	ZZZZZZ	5558	174960	18811	10546
15:47	ZZZZZZ	5678	178540	19210	10742
15:52	ZZZZZZ	5741	179150	18997	10813
15:57	ZZZZZZ	5739	180070	19030	11270
16:02	MA52515-CCV5	5513	173210	18730	10189
16:10	MA52515-CCB5	5671	177910	18245	11127
16:15	MA52515-CRI3	5661	177000	18545	10968
16:20	MA52515-ICSA3	5252	160780	18517	9326
16:25	MA52515-ICSAB3	5135	157850	17996	9173
16:30	MA52515-CCV6	5581	171700	18361	10279
16:35	MA52515-CCB6	5710	178760	18652	11180
16:40	ZZZZZZ	5541	175480	18314	11104
16:45	ZZZZZZ	5616	176710	18247	11051
16:50	ZZZZZZ	5744	180800	18769	11282

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/03/22  
Run ID: MA52515

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	anr							
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3								
Cobalt	50	.4								
Copper	10	.8	anr							
Iron	100	5.3	-2.00	<100	-3.30	<100	-0.200	<100	0.400	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8	anr							
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			15:31 CCB4		16:10 CCB5		16:35 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	17						
Antimony	6.0	1.7	anr					
Arsenic	3.0	2.1	anr					
Barium	200	.8	anr					
Beryllium	1.0	.3	anr					
Bismuth	20	2.3						
Boron	100	2.3						
Cadmium	3.0	.3	anr					
Calcium	5000	6.6						
Cerium	100							
Chromium	10	.3						
Cobalt	50	.4						
Copper	10	.8	anr					
Iron	100	5.3	1.10	<100	-0.900	<100	0.300	<100
Lead	3.0	1.1	anr					
Lithium	50	4.8						
Magnesium	5000	32						
Manganese	15	.1	anr					
Molybdenum	20	.6						
Nickel	10	.4	anr					
Phosphorus	50	1.2						
Potassium	10000	77	anr					
Selenium	10	3.2	anr					
Silicon	200	1.7						
Silver	10	1	anr					
Sodium	10000	34	anr					
Strontium	10	.3						
Sulfur	50	3						
Thallium	10	1.8	anr					
Tin	10	.8	anr					
Titanium	10	.5						
Tungsten	50	2.6						
Vanadium	50	.6						

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52515      Units: ug/l

Time: Sample ID:			15:31 CCB4		16:10 CCB5		16:35 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc                      20                      .1                      anr

Zirconium              10                      .3

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.3  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	
Aluminum										
Antimony	anr									
Arsenic	anr									
Barium	anr									
Beryllium	anr									
Bismuth										
Boron										
Cadmium	anr									
Calcium										
Cerium										
Chromium										
Cobalt										
Copper	anr									
Iron	40000	40700	101.8	40000	39300	98.3	40000	38700	96.8	
Lead	anr									
Lithium										
Magnesium										
Manganese	anr									
Molybdenum										
Nickel	anr									
Phosphorus										
Potassium	anr									
Selenium	anr									
Silicon										
Silver	anr									
Sodium	anr									
Strontium										
Sulfur										
Thallium	anr									
Tin	anr									
Titanium										
Tungsten										
Vanadium										

90-110

6.2.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery Run ID: MA52515 Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1	CCV	CCV1	CCV	CCV2	Results	% Rec	Results	% Rec
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28		15:27		16:02	
Sample ID:	CCV	CCV3		CCV	CCV4	CCV	CCV5
Metal	True	Results	% Rec	True	Results	% Rec	Results
Aluminum							
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	40000	37700	94.3	40000	36600	91.5	40000
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin	anr						
Titanium							
Tungsten							
Vanadium							

90-110

6.2.4

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28			15:27			16:02		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.2.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery Run ID: MA52515 Units: ug/l

Time:	16:30
Sample ID:	CCV
Metal	True
Results	% Rec

Aluminum none bracketed

Antimony anr

Arsenic anr

Barium anr

Beryllium anr

Bismuth

Boron

Cadmium anr

Calcium

Cerium

Chromium

Cobalt

Copper anr

Iron 40000 36500 91.3

Lead anr

Lithium

Magnesium

Manganese anr

Molybdenum

Nickel anr

Phosphorus

Potassium anr

Selenium anr

Silicon

Silver anr

Sodium anr

Strontium

Sulfur

Thallium anr

Tin anr

Titanium

Tungsten

Vanadium

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:	16:30
Sample ID:	CCV
	CCV6
Metal	True
Results	% Rec

Zinc      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03		13:09	
Sample ID:	HSTD	HSTD1		HSTD2	
Metal	True	Results	% Rec	True	Results % Rec
Aluminum					
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium					
Cerium					
Chromium					
Cobalt					
Copper	anr				
Iron		200000	186000	93.0	
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Sulfur					
Thallium	anr				
Tin	anr				
Titanium					
Tungsten					
Vanadium					

90-110

6.2.5  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03			13:09		
Sample ID:		HSTD	HSTD1	HSTD	HSTD2		
Metal		True	Results	% Rec	True	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.2.5

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	12:43 CRID1	12:48 CRI1	14:38 CRI2
Metal	True	True	True	Results % Rec	Results % Rec	Results % Rec
Aluminum	200	500	100			
Antimony	6.0	20	3.0			
Arsenic	8.0	20	3.0	anr		
Barium	200		4.0	anr		
Beryllium	2.0		1.0	anr		
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0	anr		
Calcium	5000	2000	1000			
Cerium						
Chromium	10		2.0			
Cobalt	50		3.0			
Copper	10		2.0			
Iron	100	500		99.3	99.3	95.5
Lead	3.0	20	2.5			
Lithium	50					
Magnesium	5000	2000	100			
Manganese	15		3.0	anr		
Molybdenum	20					
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000	anr		
Selenium	10	20	5.0			
Silicon	200					
Silver	5.0		2.0			
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0			
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0			

6.2.6

6

70-130

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					12:43		12:48		14:38	
Sample ID:	CRI	CRIA	CRID	CRID1	CRID1		CRI1		CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:43 CRID2	% Rec	16:15 CRI3	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100				
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	anr			
Barium	200		4.0	anr			
Beryllium	2.0		1.0	anr			
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0	anr			
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0				
Copper	10		2.0				
Iron	100	500			91.8	91.8	
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0	anr			
Molybdenum	20						
Nickel	10		4.0	anr			
Phosphorus	50						
Potassium	5000		2000	anr			
Selenium	10	20	5.0				
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000	anr			
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

70-130



6.2.6

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					14:43		16:15	
Sample ID:	CRI	CRIA	CRID	CRID2	CRI3			
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	12:53 ICSAB1 Results	% Rec	12:58 ICSAB1 Results	% Rec	14:48 ICSAB2 Results	% Rec	14:53 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	478000	95.6	471000	94.2	455000	91.0	458000	91.6
Antimony		1000	1.90		927	92.7	4.20		899	89.9
Arsenic		1000	-1.30		940	94.0	-1.00		904	90.4
Barium		500	5.90		465	93.0	5.40		447	89.4
Beryllium		500	0.200		461	92.2	0.200		449	89.8
Bismuth		500	-16.3		470	94.0	-16.8		449	89.8
Boron		500	0.500		465	93.0	-0.200		448	89.6
Cadmium		1000	-0.800		981	98.1	-1.20		944	94.4
Calcium	400000	400000	377000	94.3	376000	94.0	357000	89.3	364000	91.0
Cerium			144*		605*		141*		584*	
Chromium		500	5.40		465	93.0	4.60		451	90.2
Cobalt		500	1.10		469	93.8	1.30		453	90.6
Copper		500	1.20		482	96.4	1.10		470	94.0
Iron	200000	200000	197000	98.5	192000	96.0	189000	94.5	185000	92.5
Lead		1000	1.70		901	90.1	-1.90		873	87.3
Lithium		500	-5.50		455	91.0	-8.10		437	87.4
Magnesium	500000	500000	479000	95.8	477000	95.4	464000	92.8	462000	92.4
Manganese		500	-1.90		483	96.6	-2.30		468	93.6
Molybdenum		500	-2.80		454	90.8	-2.30		437	87.4
Nickel		1000	-3.70		896	89.6	-3.90		866	86.6
Phosphorus		500	-2.40		451	90.2	-2.00		433	86.6
Potassium			-601		-590		-606		-567	
Selenium		1000	-4.50		875	87.5	0.800		846	84.6
Silicon		500	3.40		505	101.0	4.10		489	97.8
Silver		1000	1.50		947	94.7	0.200		921	92.1
Sodium			110		127		149		126	
Strontium		500	-0.900		464	92.8	-0.800		448	89.6
Sulfur		500	24.0		484	96.8	20.5		474	94.8
Thallium		1000	-3.70		882	88.2	-2.90		852	85.2
Tin		500	-5.70		450	90.0	-5.50		436	87.2
Titanium		500	-1.80		471	94.2	-1.60		457	91.4
Tungsten		500	-2.30		462	92.4	-2.50		443	88.6
Vanadium		500	1.70		474	94.8	2.50		460	92.0

6.2.7  
6

80-120

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				12:53			12:58			14:48			14:53
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	-3.40			906	90.6	-3.10		874	87.4		
Zirconium		500	-7.00			428	85.6	-7.00		415	83.0		

(\*) Outside of QC limits  
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	16:20 ICSAB3 Results	% Rec	16:25 ICSAB3 Results	% Rec
Metal						
Aluminum	500000	500000	450000	90.0	448000	89.6
Antimony		1000	1.80		872	87.2
Arsenic		1000	1.20		881	88.1
Barium		500	5.20		440	88.0
Beryllium		500	0.100		432	86.4
Bismuth		500	-15.3		441	88.2
Boron		500	0.500		439	87.8
Cadmium		1000	-0.800		928	92.8
Calcium	400000	400000	354000	88.5	357000	89.3
Cerium			137*		573*	
Chromium		500	4.80		440	88.0
Cobalt		500	0.800		442	88.4
Copper		500	0.700		458	91.6
Iron	200000	200000	185000	92.5	182000	91.0
Lead		1000	-0.100		847	84.7
Lithium		500	-7.90		435	87.0
Magnesium	500000	500000	449000	89.8	449000	89.8
Manganese		500	-2.10		455	91.0
Molybdenum		500	-2.10		427	85.4
Nickel		1000	-3.60		839	83.9
Phosphorus		500	-1.80		424	84.8
Potassium			-549		-528	
Selenium		1000	0.500		821	82.1
Silicon		500	1.90		476	95.2
Silver		1000	1.00		900	90.0
Sodium			154		139	
Strontium		500	-0.900		440	88.0
Sulfur		500	37.9		465	93.0
Thallium		1000	1.10		826	82.6
Tin		500	-5.40		425	85.0
Titanium		500	-1.60		444	88.8
Tungsten		500	-3.20		431	86.2
Vanadium		500	2.00		448	89.6

80-120

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				16:20		16:25	
Sample ID:		ICSA	ICSAB	ICSA3		ICSAB3	
Metal		True	True	Results	% Rec	Results	% Rec

Zinc		1000		-2.90		854	85.4
Zirconium		500		-6.60		401	80.2

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	9.2	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	0.70	<3.0
Barium	200	.2	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	1.8	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	3.3	32	7.9	<100
Lead	3.0	1.1	1.8		
Lithium	50	1.5	7.3		
Magnesium	5000	25	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	35	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	14	570		
Strontium	10	.1	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	1.3	40		
Vanadium	50	.5	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	RL	IDL	MDL	MB raw	final
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Zinc 20 .1 6.9

Zirconium 10 .3 4.1

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	633000	631000	2000	-100.0(a) 75-125 4x no eval
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	108000	129000	25000	84.0 75-125 4x no eval
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MS	SpikeLot MPSPK2	% Rec	QC Limits
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Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original	MSD	SpikeLot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	633000	634000	2000	50.0 (a)	0.5	20
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Cerium						
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	108000	130000	25000	88.0	0.8	20
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	anr					

4x no eval

4x no eval

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45438  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/01/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1870	2000	93.5	80-120
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	25300	25000	101.2	80-120
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

## 6.3.3 6

Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Zirconium

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	633000	651000	2.9	0-10
Barium	anr		67.4	
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Cerium				
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	108000	112000	3.3	0-10
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			

see Report of Analysis for the Arsenic Result.

J both results

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45438  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33185  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/01/22

Metal	JD45438-2F Original SDL 1:5	%DIF	QC Limits
-------	--------------------------------	------	--------------

Zinc anr

Zirconium

Associated samples MP33185: JD45438-1F, JD45438-2F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

**B.     SDG JD45493**





Sample Summary

Sunoco/Evergreen

Job No: JD45493

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45493-1F	05/25/22	11:20 MF	05/25/22	AQ	Groundwater Filtered	MW-606D_20220525
JD45493-2F	05/25/22	12:20 MF	05/25/22	AQ	Groundwater Filtered	MW-56D_20220525
JD45493-3F	05/25/22	13:45 MF	05/25/22	AQ	Groundwater Filtered	MW-531L_20220525
JD45493-4F	05/25/22	15:00 MF	05/25/22	AQ	Groundwater Filtered	MW-532L_20220525
JD45493-4FD	05/25/22	15:00 MF	05/25/22	AQ	Water Dup/MSD	MW-532L_20220525
JD45493-4FS	05/25/22	15:00 MF	05/25/22	AQ	Water Matrix Spike	MW-532L_20220525
JD45493-5F	05/25/22	15:00 MF	05/25/22	AQ	Groundwater Filtered	MW-532L_20220525_DUP

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45493

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/2/2022 11:24:24 AM

On 05/25/2022, 5 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45493 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33174

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45493-4FMS, JD45493-4FMSD, JD45493-4FSDL were used as the QC samples for metals.
- Matrix Spike/Matrix Spike Duplicate Recovery(s) for Arsenic are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information. 4x
- MP33174-MB1 for Arsenic: All reported results >3000x MB value.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Thursday, June 02, 2022

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## CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX: 732-329-3499/3480  
www.sgs.com/ehsusa

VP-05522-11

Page 1 of 1

EHSQA-QAC-0023-04-FORM Standard COC

Client / Reporting Information			Project Information			Requested Analysis										Matrix Codes				
Company Name: <b>Sunborn Head &amp; Assoc.</b>			Project Name: <b>Evergreen MHC A017</b>			<b>As, Fe [DISS FT]</b> <b>SS (H2O)</b> <b>SO4 (H2O)</b>										<div>DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank</div>				
Street Address: <b>20 Foundry St</b>			Street: <b>100 Green Street</b>																	
City: <b>Concord</b> State: <b>NH</b> Zip: <b>03301</b>			City: <b>Morrisville</b> State: <b>PA</b>																	
Project Contact: <b>Shana Whitney</b> E-mail: <b>swhitney@sunborn.com</b>			Project #: <b>4862.04</b>																	
Phone #: <b>603 415 4159</b>			Client Purchase Order #: <b>4862.04</b>																	
Sample(s) Name(s): <b>Michael Fuerte</b> Phone #: <b>262 496 9259</b>			Project Manager: <b>Chelsey Shepsko</b> Attention:																	
SGS Sample #	Field ID / Point of Collection	MECH/DI Val #	Date	Time	Sampled By	Seal ID (Comp ID)	Source Characterized (Y/N)	Matrix	# of bottles	HC	NaOH	PH	PC	HSO4	NO3	DI Water	MECH	ENDURE	LAB USE ONLY	
1F	MW-606D-20220525		5/24/22	1120	MF	G		GW	1										X	(A35)
2F	MW-56D-20220525		5/24/22	1220	MF	G		GW	1										X	
3F	MW-531L-20220525		5/25/22	1345	MF	G		GW	1										X	
4F	MW-532L-20220525		5/25/22	1500	MF	G		GW	3										X	
5F	MW-532L-20220525-DUP		5/25/22	1500	MF	G		GW	1										X	
Turn Around Time (Business Days)			Approved By (SGS PM) / Date:			Deliverable										Comments / Special Instructions				
<input checked="" type="checkbox"/> 10 Business Days <input type="checkbox"/> 5 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 1 Business Day <input type="checkbox"/> Other _____ All data available via Lablink			Approval needed for 1-3 Business Day TAT			<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NJ Reduced (Level 3) <input checked="" type="checkbox"/> Full Tier I (Level 4) <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ DKQP <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> MA MCP Criteria <input type="checkbox"/> CT RCP Criteria <input type="checkbox"/> State Form <input checked="" type="checkbox"/> EDD Format <b>State - EQIS</b> <input type="checkbox"/> ODD-QSMS <input type="checkbox"/> Initial Assessment <input type="checkbox"/> Label Verification										http://www.sgs.com/en/terms-and-conditions				
Sample Custody must be documented below each time samples change possession, including courier delivery.																				
Relinquished By: <b>SP</b>	Date / Time: <b>5/25/22 1400</b>	Received By: <b>Pete Kaller</b>	Date / Time: <b>5/25/22</b>	Relinquished By: <b>Peter Kaller</b>	Date / Time: <b>5/25/22</b>	Received By: <b>[Signature]</b>														
Relinquished By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Received By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Relinquished By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Received By: <b>[Signature]</b>														
Relinquished By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Received By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Relinquished By: <b>[Signature]</b>	Date / Time: <b>[Signature]</b>	Received By: <b>[Signature]</b>														
Custody Seal # <b>[Signature]</b>							<input type="checkbox"/> Intact <input type="checkbox"/> Not intact <input type="checkbox"/> Absent							Therm ID: <b>[Signature]</b> Cooler Temp: <b>23.6</b>						

JD45493: Chain of Custody

Page 1 of 2



## SGS Sample Receipt Summary

Job Number: JD45493

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/25/2022 7:00:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C: Cooler 1: (2.3);

Cooler Temps (Corrected) °C: Cooler 1: (2.0);

### Cooler Security

Y or N

1. Custody Seals Present:

☒ ☒ ☐

3. COC Present:

☒ ☒ ☐

2. Custody Seals Intact:

☒ ☒ ☐

4. Smpl Dates/Time OK

☒ ☒ ☐

### Cooler Temperature

Y or N

1. Temp criteria achieved:

☒ ☒ ☐

2. Cooler temp verification:

IR Gun

3. Cooler media:

Ice (Bag)

4. No. Coolers:

1

### Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler:

☐ ☒ ☒ ☐

2. Trip Blank listed on COC:

☐ ☒ ☒ ☐

3. Samples preserved properly:

☒ ☒ ☐

4. VOCs headspace free:

☐ ☐ ☒ ☒

### Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles:

☒ ☒ ☐

2. Container labeling complete:

☒ ☒ ☐

3. Sample container label / COC agree:

☒ ☒ ☐

### Sample Integrity - Condition

Y or N

1. Sample recvd within HT:

☒ ☒ ☐

2. All containers accounted for:

☒ ☒ ☐

3. Condition of sample:

Intact

### Sample Integrity - Instructions

Y or N

N/A

1. Analysis requested is clear:

☒ ☒ ☐

2. Bottles received for unspecified tests

☐ ☒ ☒

3. Sufficient volume recvd for analysis:

☒ ☒ ☐

4. Compositing instructions clear:

☐ ☐ ☒ ☒

5. Filtering instructions clear:

☐ ☐ ☒ ☒

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD45493: Chain of Custody

Page 2 of 2



<b>Qual:</b>	Qualifier(s) based on evaluation(s) other than Total/ vs. Dissolved comparison, if applicable (J, U, U* or B)
<b>RPD:</b>	Relative Percent Difference
<b>QL:</b>	Quantitation Limit
<b>MDL:</b>	Method Detection Limit
<b>RL:</b>	Reporting Limit. RL = QL for QL reporting and MDL for MDL reporting
<b>J:</b>	The analyte concentration should be considered estimated
<b>U:</b>	The analyte was not detected in the sample at or above the RL indicated. The RL will be used for comparison purposes.
<b>UJ:</b>	The analyte was not detected in the sample at or above the Reporting Limit Indicated. The RL is approximate.
<b>R:</b>	The analyte was analyzed for and detected, but sample results are unreliable. The presence or absence of the analyte cannot be verified.
<b>UR:</b>	The analyte was analyzed for and not detected, but the determination that the analyte was not present in the sample is unreliable. The presence or absence of the analyte cannot be verified.
<b>U*</b>	The result was blank qualified. The RL will be used for comparison purposes.
<b>NA:</b>	The MDL (for QL reporting), RPD or Difference is not applicable

--



Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Report of Analysis

<b>Client Sample ID:</b>	MW-606D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-1F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	636000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>
Iron	319000	20000	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174



RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-56D_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-2F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	386000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>
Iron	115000	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174



RL = Reporting Limit

4.2  
4



Report of Analysis

<b>Client Sample ID:</b>	MW-531L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-3F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	202000	300	ug/l	100	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>
Iron	45600	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	MW-532L_20220525	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-4F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	1430000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	60300	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174



RL = Reporting Limit

4.4  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-532L_20220525_DUP	<b>Date Sampled:</b>	05/25/22
<b>Lab Sample ID:</b>	JD45493-5F	<b>Date Received:</b>	05/25/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	1380000	600	ug/l	200	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	51700	100	ug/l	1	05/31/22	06/01/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52496  
(2) Prep QC Batch: MP33174



RL = Reporting Limit

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:09	MA52496-STD1	1		STDA
07:14	MA52496-STD2	1		STDB
07:19	MA52496-ICV1	1		
07:26	MA52496-ICB1	1		
07:32	MA52496-CCV1	1		
07:36	MA52496-CCB1	1		
07:41	MA52496-CRID1	1		
07:46	MA52496-CRI1	1		
07:51	MA52496-ICSA1	1		
07:56	MA52496-ICSAB1	1		
08:01	MA52496-HSTD1	1		
08:07	MA52496-HSTD2	1		
08:12	ZZZZZZ	1		
08:17	ZZZZZZ	1		
08:22	MA52496-CRI2	1		
08:27	ZZZZZZ	1		
08:32	MA52496-CCV2	1		
08:37	MA52496-CCB2	1		
08:42	MP33174-MB1	1		
08:46	MP33174-B1	1		
08:51	MP33174-S1	1		
08:56	MP33174-S2	1		
09:02	JD45493-4F	1		
09:07	MP33174-SD1	5		
09:12	JD45493-1F	1		
09:17	JD45493-2F	1		
09:22	JD45493-3F	1		
09:27	JD45493-5F	1		
09:35	MA52496-CCV3	1		
09:40	MA52496-CCB3	1		
10:15	MA52496-CCV4	1		
10:20	MA52496-CCB4	1		
10:31	MP33174-S1	200		

All Fe

All As

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Dilution Factor	PS Recov	Comments
------	--------------------	-----------------	----------	----------

10:36 MP33174-S2 200

10:40 JD45493-4F 200

10:45 MP33174-SD1 1000

10:50 JD45493-1F 200

10:55 JD45493-2F 200

11:00 JD45493-3F 100

11:05 JD45493-5F 200

-----> Last reportable sample/prep for job JD45493  
11:13 ZZZZZZ 1

11:29 MA52496-CCV5 1

11:38 MA52496-CCB5 1

11:43 MA52496-CRID2 1

11:48 MA52496-CRI3 1

11:53 MA52496-ICSA2 1

11:58 MA52496-ICSAB2 1

12:03 MA52496-CCV6 1

12:08 MA52496-CCB6 1

-----> Last reportable CCB for job JD45493  
Refer to raw data for calibration curve and standards.

All As

All As

6.1

6

REPORTED ELEMENTS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Element: Dilution	A F s e
07:19	MA52496-ICV1	1	X X
07:26	MA52496-ICB1	1	X X
07:32	MA52496-CCV1	1	X X
07:36	MA52496-CCB1	1	X X
07:41	MA52496-CRID1	1	X X
07:46	MA52496-CRI1	1	X X
07:51	MA52496-ICSA1	1	X X
07:56	MA52496-ICSAB1	1	X X
08:01	MA52496-HSTD1	1	X X
08:07	MA52496-HSTD2	1	X X
08:12	ZZZZZZ	1	
08:17	ZZZZZZ	1	
08:22	MA52496-CRI2	1	X X
08:27	ZZZZZZ	1	
08:32	MA52496-CCV2	1	X X
08:37	MA52496-CCB2	1	X X
08:42	MP33174-MB1	1	X X
08:46	MP33174-B1	1	X X
08:51	MP33174-S1	1	X
08:56	MP33174-S2	1	X
09:02	JD45493-4F	1	X
09:07	MP33174-SD1	5	X
09:12	JD45493-1F	1	
09:17	JD45493-2F	1	X
09:22	JD45493-3F	1	X
09:27	JD45493-5F	1	X
09:35	MA52496-CCV3	1	X X
09:40	MA52496-CCB3	1	X X
10:15	MA52496-CCV4	1	X X
10:20	MA52496-CCB4	1	X X
10:31	MP33174-S1	200	X
10:36	MP33174-S2	200	X
10:40	JD45493-4F	200	X
		Element: A F s e	

analyzed later; ok

REPORTED ELEMENTS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Element: Dilution	A F s e
10:45	MP33174-SD1	1000	X
10:50	JD45493-1F	200	X X
10:55	JD45493-2F	200	X
11:00	JD45493-3F	100	X
11:05	JD45493-5F	200	X
11:13	ZZZZZZ	1	
11:29	MA52496-CCV5	1	X X
11:38	MA52496-CCB5	1	X X
11:43	MA52496-CRID2	1	X X
11:48	MA52496-CRI3	1	X X
11:53	MA52496-ICSA2	1	X X
11:58	MA52496-ICSAB2	1	X X
12:03	MA52496-CCV6	1	X X
12:08	MA52496-CCB6	1	X X

Element: A F s e

## INTERNAL STANDARD SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:09	MA52496-STD1	5922 R	174400 R	17897 R	10465 R
07:14	MA52496-STD2	5655	163710	17799	9333
07:19	MA52496-ICV1	5791	168480	17902	9621
07:26	MA52496-ICB1	5960	175940	18045	10503
07:32	MA52496-CCV1	5848	169670	18044	9683
07:36	MA52496-CCB1	5997	177330	18170	10524
07:41	MA52496-CRID1	5998	177280	18210	10495
07:46	MA52496-CRI1	5982	176500	18290	10364
07:51	MA52496-ICSA1	5497	157530	17964	8802
07:56	MA52496-ICSAB1	5522	158330	17933	8827
08:01	MA52496-HSTD1	5917	174150	18252	10389
08:07	MA52496-HSTD2	5557	160220	17982	8837
08:12	ZZZZZZ	6082	177980	18504	10789
08:17	ZZZZZZ	6044	181240	18581	10858
08:22	MA52496-CRI2	6050	178230	18384	10497
08:27	ZZZZZZ	6104	180040	18404	10682
08:32	MA52496-CCV2	5959	173470	18422	9864
08:37	MA52496-CCB2	6138	181130	18449	10752
08:42	MP33174-MB1	6164	182850	18855	10800
08:46	MP33174-B1	6121	178630	18821	10255
08:51	MP33174-S1	5452	160040	18172	8664
08:56	MP33174-S2	5511	161530	18308	8719
09:02	JD45493-4F	5565	163730	18728	8806
09:07	MP33174-SD1	6020	177350	19240	9911
09:12	JD45493-1F	5206	150970	18549	8240
09:17	JD45493-2F	5525	160750	18400	8806
09:22	JD45493-3F	5873	173490	19014	9536
09:27	JD45493-5F	5568	164580	18621	8820
09:35	MA52496-CCV3	6096	177240	18813	10116
09:40	MA52496-CCB3	6242	186440	19020	10980
10:15	MA52496-CCV4	6141	179240	19115	10169
10:20	MA52496-CCB4	6337	186650	19259	11098
10:31	MP33174-S1	6362	188300	19237	11073



## INTERNAL STANDARD SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52496

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:36	MP33174-S2	6350	187820	19438	11078
10:40	JD45493-4F	6337	187150	19327	11065
10:45	MP33174-SD1	6354	188110	19384	11134
10:50	JD45493-1F	6322	187050	19447	10947
10:55	JD45493-2F	6343	188690	19496	11058
11:00	JD45493-3F	6357	188840	19404	11125
11:05	JD45493-5F	6377	189220	19506	11115
11:13	ZZZZZZ	6485	193490	19734	11360
11:29	MA52496-CCV5	6276	183040	19588	10382
11:38	MA52496-CCB5	6446	191430	19679	11305
11:43	MA52496-CRID2	6414	190750	19701	11207
11:48	MA52496-CRI3	6423	190310	19714	11127
11:53	MA52496-ICSA2	5896	170180	19322	9421
11:58	MA52496-ICSAB2	5935	171400	19414	9471
12:03	MA52496-CCV6	6335	185120	19677	10455
12:08	MA52496-CCB6	6512	191530	19957	11366

R = Reference for ISTD Limits.

= outside limit

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/01/22  
Run ID: MA52496

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			07:26 ICB1		07:36 CCB1		08:37 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7								
Arsenic	3.0	2.1	-0.500	<3.0	0.00	<3.0	0.900	<3.0	10.6	* (a)
Barium	200	.8								
Beryllium	1.0	.3								
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3								
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3								
Cobalt	50	.4								
Copper	10	.8								
Iron	100	5.3	3.00	<100	4.10	<100	1.70	<100	4.10	<100
Lead	3.0	1.1								
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1								
Molybdenum	20	.6								
Nickel	10	.4								
Phosphorus	50	1.2								
Potassium	10000	77								
Selenium	10	3.2								
Silicon	200	1.7								
Silver	10	1								
Sodium	10000	34								
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8								
Tin	10	.8								
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

only Fe  
bracketed

6.1.3

6

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:			07:26 ICB1		07:36 CCB1		08:37 CCB2		09:40 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1								
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										
(a) No samples reported for this element in the area bracketed by this QC.										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/01/22  
Run ID: MA52496

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			10:20 CCB4		11:38 CCB5		12:08 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	17						
Antimony	6.0	1.7						
Arsenic	3.0	2.1	1.90	<3.0	1.70	<3.0	0.600	<3.0
Barium	200	.8						
Beryllium	1.0	.3						
Bismuth	20	2.3						
Boron	100	2.3						
Cadmium	3.0	.3						
Calcium	5000	6.6						
Cerium	100							
Chromium	10	.3						
Cobalt	50	.4						
Copper	10	.8						
Iron	100	5.3	6.90	<100	6.20	<100	5.00	<100
Lead	3.0	1.1						
Lithium	50	4.8						
Magnesium	5000	32						
Manganese	15	.1						
Molybdenum	20	.6						
Nickel	10	.4						
Phosphorus	50	1.2						
Potassium	10000	77						
Selenium	10	3.2						
Silicon	200	1.7						
Silver	10	1						
Sodium	10000	34						
Strontium	10	.3						
Sulfur	50	3						
Thallium	10	1.8						
Tin	10	.8						
Titanium	10	.5						
Tungsten	50	2.6						
Vanadium	50	.6						

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52496 Units: ug/l

Time: Sample ID:			10:20 CCB4		11:38 CCB5		12:08 CCB6	
Metal	RL	IDL	raw	final	raw	final	raw	final

Zinc 20 .1

Zirconium 10 .3

(\*) Outside of QC limits

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		07:19		07:32		08:32	
Sample ID:		ICV	ICV1	CCV	CCV1	CCV	CCV2
Metal	True	Results	% Rec	True	Results	% Rec	Results
Aluminum				none bracketed			
Antimony							
Arsenic	2000	2050	102.5	2000	1950	97.5	2000
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper							
Iron	40000	41100	102.8	40000	39600	99.0	40000
Lead							
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel							
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

6.1.4  
6

90-110

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		07:19			07:32			08:32		
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		09:35		10:15		11:29	
Sample ID:		CCV		CCV		CCV	
Metal		True		True		True	
		Results	% Rec	Results	% Rec	Results	% Rec
Aluminum							
Antimony							
Arsenic	2000	1880	94.0	2000	1860	93.0	2000
Barium							
Beryllium							
Bismuth							
Boron							
Cadmium							
Calcium							
Cerium							
Chromium							
Cobalt							
Copper							
Iron	40000	37800	94.5	40000	36900	92.3	40000
Lead							
Lithium							
Magnesium							
Manganese							
Molybdenum							
Nickel							
Phosphorus							
Potassium							
Selenium							
Silicon							
Silver							
Sodium							
Strontium							
Sulfur							
Thallium							
Tin							
Titanium							
Tungsten							
Vanadium							

90-110

rounds to 90%, no qual

J/UJ - 1F

89.8\*(a)

6.1.4

6



CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:		09:35			10:15			11:29		
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

6.1.4

6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery Run ID: MA52496 Units: ug/l

Time:		12:03	
Sample ID:		CCV	
Metal		True	
		Results	
		% Rec	
Aluminum			
Antimony		none bracketed	
Arsenic	2000	1810	90.5
Barium			
Beryllium			
Bismuth			
Boron			
Cadmium			
Calcium			
Cerium			
Chromium			
Cobalt			
Copper			
Iron	40000	35700	89.3*(a)
Lead			
Lithium			
Magnesium			
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium			
Strontium			
Sulfur			
Thallium			
Tin			
Titanium			
Tungsten			
Vanadium			

none bracketed

6.1.4  
6

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52496      Units: ug/l

Time:	12:03
Sample ID:	CCV
Metal	True
Results	% Rec

Zinc

Zirconium

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52496 Units: ug/l

Time:		08:01		08:07		
Sample ID:	HSTD	HSTD1	HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum						
Antimony						
Arsenic	8000	7500	93.8			
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium						
Cerium						
Chromium						
Cobalt						
Copper						
Iron				200000	190000	95.0
Lead						
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium						
Strontium						
Sulfur						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						

90-110

6.1.5

6

HIGH STANDARD CHECK SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 90 to 110 % Recovery      Run ID: MA52496      Units: ug/l

Time:		08:01		08:07		
Sample ID:		HSTD1		HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec

Zinc

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.5

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	07:41 CRID1	07:46 CRI1	08:22 CRI2	
Metal	True	True	True	Results	% Rec	Results	% Rec
Aluminum	200	500	100				
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	2.60	86.7	7.70	96.3
Barium	200		4.0				
Beryllium	2.0		1.0				
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0				
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0				
Copper	10		2.0				
Iron	100	500			108	108.0	104
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0				
Molybdenum	20						
Nickel	10		4.0				
Phosphorus	50						
Potassium	5000		2000				
Selenium	10	20	5.0				
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000				
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

70-130

6.1.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time:					07:41		07:46		08:22	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True							

Zinc 20 10

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.6

6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	11:43 CRID2	% Rec	11:48 CRI3	% Rec
Metal	True	True	True	Results		Results	
Aluminum	200	500	100				
Antimony	6.0	20	3.0				
Arsenic	8.0	20	3.0	3.50	116.7	7.40	92.5
Barium	200		4.0				
Beryllium	2.0		1.0				
Bismuth	20						
Boron	100		10				
Cadmium	3.0		1.0				
Calcium	5000	2000	1000				
Cerium							
Chromium	10		2.0				
Cobalt	50		3.0				
Copper	10		2.0				
Iron	100	500				97.8	97.8
Lead	3.0	20	2.5				
Lithium	50						
Magnesium	5000	2000	100				
Manganese	15		3.0				
Molybdenum	20						
Nickel	10		4.0				
Phosphorus	50						
Potassium	5000		2000				
Selenium	10	20	5.0				
Silicon	200						
Silver	5.0		2.0				
Sodium	5000		1000				
Strontium	10						
Sulfur	50						
Thallium	10		2.0				
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0				

70-130



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52496 Units: ug/l

Time:					11:43		11:48	
Sample ID:	CRI	CRIA	CRID		CRID2		CRI3	
Metal	True	True	True	Results	% Rec	Results	% Rec	

Zinc 20 10

Zirconium 10

(\*) Outside of QC limits

(anr) Analyte not requested

6.1.6

6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP      Date Analyzed: 06/01/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52496      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	07:51 ICSAB1 Results	% Rec	07:56 ICSAB1 Results	% Rec	11:53 ICSAB2 Results	% Rec	11:58 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	491000	98.2	482000	96.4	440000	88.0	440000	88.0
Antimony		1000	-2.40		955	95.5	-2.10		877	87.7
Arsenic		1000	-0.700		946	94.6	2.60		886	88.6
Barium		500	5.70		479	95.8	4.80		449	89.8
Beryllium		500	0.100		479	95.8	0.100		438	87.6
Bismuth		500	-14.2		472	94.4	-11.2		449	89.8
Boron		500	-0.500		469	93.8	-0.500		444	88.8
Cadmium		1000	1.50		990	99.0	1.50		920	92.0
Calcium	400000	400000	384000	96.0	385000	96.3	352000	88.0	352000	88.0
Cerium			79.8		543*		69.5		490*	
Chromium		500	1.80		465	93.0	1.70		426	85.2
Cobalt		500	1.00		476	95.2	0.500		445	89.0
Copper		500	6.00		491	98.2	3.90		455	91.0
Iron	200000	200000	202000	101.0	196000	98.0	184000	92.0	178000	89.0
Lead		1000	4.90*		924	92.4	1.30		854	85.4
Lithium		500	-6.90		467	93.4	-5.90		432	86.4
Magnesium	500000	500000	491000	98.2	485000	97.0	448000	89.6	444000	88.8
Manganese		500	1.10		492	98.4	1.50		455	91.0
Molybdenum		500	-2.70		456	91.2	-1.80		426	85.2
Nickel		1000	-8.60		912	91.2	-6.90		845	84.5
Phosphorus		500	-5.30		458	91.6	-9.90		428	85.6
Potassium			-451		-360		-283		-223	
Selenium		1000	-3.90		881	88.1	0.00		828	82.8
Silicon		500	6.10		510	102.0	5.00		474	94.8
Silver		1000	1.50		946	94.6	4.80		869	86.9
Sodium			110		97.0		136		124	
Strontium		500	-1.00		475	95.0	-1.00		442	88.4
Sulfur		500	28.5		487	97.4	49.1		477	95.4
Thallium		1000	0.200		914	91.4	-1.50		848	84.8
Tin		500	-5.80		453	90.6	-6.30		422	84.4
Titanium		500	-2.00		477	95.4	-1.60		433	86.6
Tungsten		500	-1.80		465	93.0	-0.800		432	86.4
Vanadium		500	-4.60		475	95.0	-5.90		450	90.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060122M1.ICP Date Analyzed: 06/01/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52496 Units: ug/l

Time:				07:51			07:56			11:53			11:58
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc	1000	3.10		917	91.7	2.80		844	84.4
Zirconium	500	-1.00		431	86.2	-0.100		398	79.6*

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHAPFW: Marcus Hook, PA

QC Batch ID: MP33174  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	56.5	* (a)
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	5.3	32	7.2	<100
Lead	3.0	1.1	1.8		
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

all samples > 5x detect level,  
including DF

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45493  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 05/31/22

Metal	RL	IDL	MDL	MB raw	final
Zinc	20	.1	6.9		
Zirconium	10	.3	4.1		

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) All reported results >3000x MB value.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original MS		SpikeLot MPSPK2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	1430000	1420000	2000	-500.0(a	75-125 4x no eval
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron	60300	82100	25000	87.2	75-125
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original MS	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F		Spikelot	MSD	QC
	Original	MSD	MPSPK2	RPD	Limit
Aluminum					
Antimony					
Arsenic	1430000	1410000	2000	-1000.0a 0.7	20
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium					
Cerium					
Chromium					
Cobalt					
Copper					
Iron	60300	82000	25000	86.8 0.1	20
Lead					
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium					
Strontium					
Sulfur					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					

4x no eval



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	2090	2000	104.5	80-120
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	24100	25000	96.4	80-120
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
-------	---------------	--------------------	-------	--------------

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	1430000	1490000	4.2	0-10
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium				
Cerium				
Chromium				
Cobalt				
Copper				
Iron	60300	62300	3.3	0-10
Lead				
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium				
Strontium				
Sulfur				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45493  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33174  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 05/31/22

Metal	JD45493-4F		QC	
	Original	SDL 1:5	%DIF	Limits

Zinc

Zirconium

Associated samples MP33174: JD45493-1F, JD45493-2F, JD45493-3F, JD45493-4F, JD45493-5F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.4

6

**C.     SDG JD45654**



Sample Summary

Sunoco/Evergreen

Job No: JD45654

SANHPAFW: Marcus Hook, PA  
Project No: 4862.04 PO#4862.04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD45654-1F	05/26/22	08:00 MF	05/26/22	AQ	Groundwater Filtered	MW-607D_20220526
JD45654-2F	05/26/22	10:10 MF	05/26/22	AQ	Groundwater Filtered	MW-560D_20220526
JD45654-3F	05/26/22	11:10 MF	05/26/22	AQ	Groundwater Filtered	MW-559D_20220526
JD45654-4F	05/26/22	12:20 MF	05/26/22	AQ	Equip Blank Filtered	EB-01_20220526

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Sunoco/Evergreen

**Job No** JD45654

**Site:** SANHPAFW: Marcus Hook, PA

**Report Date** 6/6/2022 11:26:07 AM

On 05/26/2022, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD45654 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### Metals Analysis By Method SW846 6010D

**Matrix:** AQ

**Batch ID:** MP33220

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD45654-2FMS, JD45654-2FMSD, JD45654-2FSDL were used as the QC samples for metals.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.


SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Monday, June 06, 2022

Page 1 of 1



**SGS North America Inc. - Dayton**  
2235 Route 130, Dayton, NJ 08810  
**TEL. 732-329-0200 FAX: 732-329-3499/3480**  
**[www.sgs.com/ehsusa](http://www.sgs.com/ehsusa)**



**SGS North America Inc. - Dayton**  
 2235 Route 130, Dayton, NJ 08810  
 TEL: 732-329-0200 FAX: 732-329-3499/3480  
 www.sgs.com/ehusa

FED-EX Tracking #

SGS Quote #

Bottle Order Control #  
**V8-05522-11**

SGS Job #  
**JD45654**

**Client Reporting Information**

Company Name: **Sunborn Head & Associates**

Street Address: **20 Foundry St**

City: **Concord** State: **NH** Zip: **03301**

Project Contact: **Shana White** Email: **shana@sunbornhead.com**

Phone #: **603-415-6159**

Samples (s) Target(s): **Michael Huarte** Phone #: **262-48-7879**

**Project Information**

Project Name: **Evergreen ACI 7 MHIC**

Street: **100 Green St**

City: **Marcus Hook, PA** State: **PA**

Billing Information (if different from Report to):

Company Name:

Street Address:

City: State: Zip:

Client Purchase Order #:

Attention:

**Requested Analysis**

Matrix Codes	Requested Analysis
DW - Drinking Water	
GW - Ground Water	
WW - Wastewater	
SW - Surface Water	
SD - Soil	
SL - Sludge	
SED - Sediment	
OL - Oil	
LIQ - Other Liquid	
AIR - Air	
SOL - Other Solid	
WP - Waste	
FB - Field Blank	
EB - Equipment Blank	
RB - Rinse Blank	
TB - Trip Blank	

**LAB USE ONLY**

SGS Sample #	Field ID / Point of Collection	MEOH/DI Val #	Date	Time	Sampled by	Grav (G) Comp (C)	Source (Original) (YN)	Matrix	# of bottles	HC	NaOH	HNO3	H2SO4	NONE	D- Wt/ht	MEOH	ENCORE	ph Check (Lab Use Only)
10	MW-607D-20220526		5/26/22	800	MF	G	GH	1										X
20	MW-560D-20220526		5/26/22	1010	MF	G	GH	1										X
30	MW-559D-20220526		5/26/22	1110	MF	G	GH	1										X
40	EB-01-20220526		5/26/22	1220	MF	G	EB	1										X

**Turn Around Time (Business Days)**

☒ 10 Business Days

☐ 5 Business Days

☐ 3 Business Days

☐ 2 Business Days

☐ 1 Business Day

☐ Other

All data available via Lablink

**Deliverable**

Approved By (SGS PM) / Date:

☐ Commercial "A" (Level 1)

☐ Commercial "B" (Level 2)

☐ NJ Reduced (Level 3)

☒ Full Tier (Level 4)

☐ Commercial "C"

☐ NJ DKOP

☐ NYASP Category A

☐ NYASP Category B

☐ MA MCP Criteria

☐ CT RCP Criteria

☐ State Forms

☒ EDD Format **Stantec Equis**

Commercial "A" = Results only; Commercial "B" = Results + QC Summary

Commercial "C" = Results + QC Summary + Partial Raw data

Sample Custody must be documented below each time samples change possession, including courier delivery.

**Comments / Special Instructions**

<http://www.sgs.com/en/terms-and-conditions>

Relinquished by	Date / Time	Received By	Date / Time	Relinquished by	Date / Time	Received By	Date / Time
<b>Michael Huarte</b>	5/26/22 1:00	<b>MARIO-IMAIL</b>	5/26/22 02:30 PM				

**Custody Seal #**

☐ Intact

☐ Marked

☐ Altered

☐ Tampered

Therm ID: **10** On: **16-48** Cooler Temp: **30.04**

## JD45654: Chain of Custody

Page 1 of 2

## SGS Sample Receipt Summary

Job Number: JD45654

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW: MARCUS HOOK, PA

Date / Time Received: 5/26/2022 4:48:00 PM

Delivery Method: \_\_\_\_\_

Airbill #s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.7);

### Cooler Security

Y or N

1. Custody Seals Present: ☒ ☒ ☐

3. COC Present: ☒ ☒ ☐

2. Custody Seals Intact: ☒ ☒ ☐

4. Smpl Dates/Time OK ☒ ☒ ☐

### Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☒ ☐

2. Cooler temp verification: IR Gun

3. Cooler media: Ice (Bag)

4. No. Coolers: 1

### Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler: ☐ ☒ ☒ ☐

2. Trip Blank listed on COC: ☐ ☒ ☒ ☐

3. Samples preserved properly: ☒ ☒ ☐

4. VOCs headspace free: ☐ ☐ ☒ ☒

### Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☒ ☐

2. Container labeling complete: ☒ ☒ ☐

3. Sample container label / COC agree: ☒ ☒ ☐

### Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☒ ☐

2. All containers accounted for: ☒ ☒ ☐

3. Condition of sample: Intact

### Sample Integrity - Instructions

Y or N

N/A

1. Analysis requested is clear: ☒ ☒ ☐

2. Bottles received for unspecified tests: ☐ ☒ ☒

3. Sufficient volume recvd for analysis: ☒ ☒ ☐

4. Compositing instructions clear: ☐ ☐ ☒ ☒

5. Filtering instructions clear: ☐ ☐ ☒ ☒

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03  
Rev. Date 12/7/17

JD45654: Chain of Custody

Page 2 of 2



Aq = Aqueous; S = Solid

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Report of Analysis

Client Sample ID:

MW-607D\_20220526

Lab Sample ID:

JD45654-1F

Matrix:

AQ - Groundwater Filtered

Project:

SANHPAFW: Marcus Hook, PA

Date Sampled:

05/26/22

Date Received:

05/26/22

Percent Solids:

n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	111000	150	ug/l	50	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	56500	5000	ug/l	50	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220



RL = Reporting Limit

4.1  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-560D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-2F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14600	15	ug/l	5	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	52800	500	ug/l	5	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220



RL = Reporting Limit

4.2  
4

Report of Analysis

<b>Client Sample ID:</b>	MW-559D_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-3F	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Groundwater Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	297	3.0	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	41500	100	ug/l	1	06/02/22	06/03/22 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220





RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	EB-01_20220526	<b>Date Sampled:</b>	05/26/22
<b>Lab Sample ID:</b>	JD45654-4F 	<b>Date Received:</b>	05/26/22
<b>Matrix:</b>	AQ - Equip Blank Filtered	<b>Percent Solids:</b>	n/a
<b>Project:</b>	SANHPAFW: Marcus Hook, PA		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By		Method	Prep Method
Arsenic	11.3	3.0	ug/l	1 	06/02/22	06/03/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Iron	< 100	100	ug/l	1 	06/02/22	06/03/22	ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA52515  
(2) Prep QC Batch: MP33220



RL = Reporting Limit

4.4  
4

SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:11	MA52515-STD1	1		STDA
12:16	MA52515-STD2	1		STDB
12:21	MA52515-ICV1	1		
12:29	MA52515-ICB1	1		
12:34	MA52515-CCV1	1		
12:38	MA52515-CCB1	1		
12:43	MA52515-CRID1	1		
12:48	MA52515-CRI1	1		
12:53	MA52515-ICSA1	1		
12:58	MA52515-ICSAB1	1		
13:03	MA52515-HSTD1	1		
13:09	MA52515-HSTD2	1		
13:16	MP33220-S1	5		
13:20	MP33220-S2	5		
13:25	ZZZZZZ	25		
13:33	MA52515-CCV2	1		
13:38	MA52515-CCB2	1		
13:43	MP33220-MB1	1		
13:48	JD45654-2F	5		
13:52	MP33220-SD1	25		
13:57	JD45654-1F	50		
14:02	MP33220-B1	1		
14:07	JD45654-3F	1		
14:12	JD45654-4F	1		undigested confirmed on ma52519
14:18	JD45654-3F	5		
----->	Last reportable sample/			
14:23	ZZZZZZ	1		
14:28	MA52515-CCV3	1		
14:33	MA52515-CCB3	1		
14:38	MA52515-CRI2	1		
14:43	MA52515-CRID2	1		
14:48	MA52515-ICSA2	1		
14:53	MA52515-ICSAB2	1		
14:58	MP33185-S1	1		Fe



SGS Instrument Runlog  
Inorganics Analyses

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Dilution Factor	PS Recov	Comments
------	--------------------	-----------------	----------	----------

15:04	MP33185-S2	1		Fe (sample used for QC only; not part of login JD45654)
15:09	JD45438-2F	1		
15:14	MP33185-SD1	5		
15:19	ZZZZZZ	1		
15:27	MA52515-CCV4	1		
15:31	MA52515-CCB4	1		
----->	Last reportable CCB for job JD45654			
15:36	ZZZZZZ	1		
15:42	ZZZZZZ	1		
15:47	ZZZZZZ	1		
15:52	ZZZZZZ	1		
15:57	ZZZZZZ	1		
16:02	MA52515-CCV5	1		
16:10	MA52515-CCB5	1		
16:15	MA52515-CRI3	1		
16:20	MA52515-ICSA3	1		
16:25	MA52515-ICSAB3	1		
16:30	MA52515-CCV6	1		
16:35	MA52515-CCB6	1		
16:40	ZZZZZZ	1		
16:45	ZZZZZZ	1		
16:50	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Dilution	A F s e
12:21	MA52515-ICV1	1	X X
12:29	MA52515-ICB1	1	X X
12:34	MA52515-CCV1	1	X X
12:38	MA52515-CCB1	1	X X
12:43	MA52515-CRID1	1	X X
12:48	MA52515-CRI1	1	X X
12:53	MA52515-ICSA1	1	X X
12:58	MA52515-ICSAB1	1	X X
13:03	MA52515-HSTD1	1	X X
13:09	MA52515-HSTD2	1	X X
13:16	MP33220-S1	5	X X
13:20	MP33220-S2	5	X X
13:25	ZZZZZZ	25	
13:33	MA52515-CCV2	1	X X
13:38	MA52515-CCB2	1	X X
13:43	MP33220-MB1	1	X X
13:48	JD45654-2F	5	X X
13:52	MP33220-SD1	25	X X
13:57	JD45654-1F	50	X X
14:02	MP33220-B1	1	X X
14:07	JD45654-3F	1	X X
14:12	JD45654-4F	1	X X
14:18	JD45654-3F	5	
14:23	ZZZZZZ	1	
14:28	MA52515-CCV3	1	X X
14:33	MA52515-CCB3	1	X X
14:38	MA52515-CRI2	1	X X
14:43	MA52515-CRID2	1	X X
14:48	MA52515-ICSA2	1	X X
14:53	MA52515-ICSAB2	1	X X
14:58	MP33185-S1	1	X
15:04	MP33185-S2	1	X
15:09	JD45438-2F	1	X (a)
		Element:	A F s e

# REPORTED ELEMENTS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Element: Dilution	A F s e
15:14	MP33185-SD1	5	X
15:19	ZZZZZZ	1	
15:27	MA52515-CCV4	1	X X
15:31	MA52515-CCB4	1	X X
15:36	ZZZZZZ	1	
15:42	ZZZZZZ	1	
15:47	ZZZZZZ	1	
15:52	ZZZZZZ	1	
15:57	ZZZZZZ	1	
16:02	MA52515-CCV5	1	X X
16:10	MA52515-CCB5	1	X X
16:15	MA52515-CRI3	1	X X
16:20	MA52515-ICSA3	1	X X
16:25	MA52515-ICSAB3	1	X X
16:30	MA52515-CCV6	1	X X
16:35	MA52515-CCB6	1	X X
16:40	ZZZZZZ	1	
16:45	ZZZZZZ	1	
16:50	ZZZZZZ	1	

(a) Sample used for QC only; not part of login JD45654.

Element: A F  
s e

## INTERNAL STANDARD SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:11	MA52515-STD1	5447 R	170800 R	17890 R	10639 R
12:16	MA52515-STD2	5199	161480	17783	9473
12:21	MA52515-ICV1	5276	163330	17707	9759
12:29	MA52515-ICB1	5385	170350	17903	10582
12:34	MA52515-CCV1	5337	165140	17913	9821
12:38	MA52515-CCB1	5429	170500	17947	10639
12:43	MA52515-CRID1	5422	171200	17932	10620
12:48	MA52515-CRI1	5362	168100	17734	10464
12:53	MA52515-ICSA1	4988	153240	17706	8890
12:58	MA52515-ICSAB1	4995	153440	17901	8896
13:03	MA52515-HSTD1	5410	170820	18103	10503
13:09	MA52515-HSTD2	5027	155540	17655	8915
13:16	MP33220-S1	5349	166980	17855	10138
13:20	MP33220-S2	5397	168410	18091	10205
13:25	ZZZZZZ	5437	169920	18235	10417
13:33	MA52515-CCV2	5353	166280	17762	9887
13:38	MA52515-CCB2	5455	170830	17843	10739
13:43	MP33220-MB1	5522	175690	18492	10838
13:48	JD45654-2F	5468	171220	18311	10420
13:52	MP33220-SD1	5518	172940	18198	10716
13:57	JD45654-1F	5519	171650	18154	10782
14:02	MP33220-B1	5450	170220	18352	10221
14:07	JD45654-3F	5010	155560	18004	9023
14:12	JD45654-4F	5571	176380	18618	10952
14:18	JD45654-3F	5362	167910	18242	9978
14:23	ZZZZZZ	5440	170230	18248	10820
14:28	MA52515-CCV3	5423	168050	18137	10011
14:33	MA52515-CCB3	5445	172030	17895	10746
14:38	MA52515-CRI2	5488	172200	18115	10680
14:43	MA52515-CRID2	5542	173630	18266	10847
14:48	MA52515-ICSA2	5125	155980	18158	9136
14:53	MA52515-ICSAB2	5145	156900	18112	9145
14:58	MP33185-S1	4923	155420	17956	8866

60-125

# INTERNAL STANDARD SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
Analyst: ND  
Parameters: As,Fe

Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
Run ID: MA52515

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
15:04	MP33185-S2	4871	154140	17715	8806
15:09	JD45438-2F	4933	154930	17970	8904
15:14	MP33185-SD1	5421	170310	18540	10072
15:19	ZZZZZZ	5482	172050	18819	10197
15:27	MA52515-CCV4	5590	173350	18743	10284
15:31	MA52515-CCB4	5574	176300	18412	10972
15:36	ZZZZZZ	4867	153810	17828	8787
15:42	ZZZZZZ	5558	174960	18811	10546
15:47	ZZZZZZ	5678	178540	19210	10742
15:52	ZZZZZZ	5741	179150	18997	10813
15:57	ZZZZZZ	5739	180070	19030	11270
16:02	MA52515-CCV5	5513	173210	18730	10189
16:10	MA52515-CCB5	5671	177910	18245	11127
16:15	MA52515-CRI3	5661	177000	18545	10968
16:20	MA52515-ICSA3	5252	160780	18517	9326
16:25	MA52515-ICSAB3	5135	157850	17996	9173
16:30	MA52515-CCV6	5581	171700	18361	10279
16:35	MA52515-CCB6	5710	178760	18652	11180
16:40	ZZZZZZ	5541	175480	18314	11104
16:45	ZZZZZZ	5616	176710	18247	11051
16:50	ZZZZZZ	5744	180800	18769	11282

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP  
QC Limits: result < RL

Date Analyzed: 06/03/22  
Run ID: MA52515

Methods: EPA 200.7, SW846 6010D  
Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17								
Antimony	6.0	1.7	anr							
Arsenic	3.0	2.1	0.00	<3.0	-0.200	<3.0	-0.900	<3.0	0.600	<3.0
Barium	200	.8	anr							
Beryllium	1.0	.3	anr							
Bismuth	20	2.3								
Boron	100	2.3								
Cadmium	3.0	.3	anr							
Calcium	5000	6.6								
Cerium	100									
Chromium	10	.3								
Cobalt	50	.4								
Copper	10	.8	anr							
Iron	100	5.3	-2.00	<100	-3.30	<100	-0.200	<100	0.400	<100
Lead	3.0	1.1	anr							
Lithium	50	4.8								
Magnesium	5000	32								
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.4	anr							
Phosphorus	50	1.2								
Potassium	10000	77	anr							
Selenium	10	3.2	anr							
Silicon	200	1.7								
Silver	10	1	anr							
Sodium	10000	34	anr							
Strontium	10	.3								
Sulfur	50	3								
Thallium	10	1.8	anr							
Tin	10	.8	anr							
Titanium	10	.5								
Tungsten	50	2.6								
Vanadium	50	.6								

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:			12:29 ICB1		12:38 CCB1		13:38 CCB2		14:33 CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zinc	20	.1	anr							
Zirconium	10	.3								
(*) Outside of QC limits										
(anr) Analyte not requested										

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL Run ID: MA52515 Units: ug/l

Time: Sample ID:		15:31 CCB4			
Metal	RL	IDL	raw	final	
Aluminum	200	17			
Antimony	6.0	1.7	anr		none bracketed
Arsenic	3.0	2.1	3.30	* (a)	
Barium	200	.8	anr		
Beryllium	1.0	.3	anr		
Bismuth	20	2.3			
Boron	100	2.3			
Cadmium	3.0	.3	anr		
Calcium	5000	6.6			
Cerium	100				
Chromium	10	.3			
Cobalt	50	.4			
Copper	10	.8	anr		
Iron	100	5.3	1.10	<100	
Lead	3.0	1.1	anr		
Lithium	50	4.8			
Magnesium	5000	32			
Manganese	15	.1	anr		
Molybdenum	20	.6			
Nickel	10	.4	anr		
Phosphorus	50	1.2			
Potassium	10000	77	anr		
Selenium	10	3.2	anr		
Silicon	200	1.7			
Silver	10	1	anr		
Sodium	10000	34	anr		
Strontium	10	.3			
Sulfur	50	3			
Thallium	10	1.8	anr		
Tin	10	.8	anr		
Titanium	10	.5			
Tungsten	50	2.6			
Vanadium	50	.6			



BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: result < RL      Run ID: MA52515      Units: ug/l

Time:		15:31		
Sample ID:		CCB4		
Metal	RL	IDL	raw	final

Zinc                      20                      .1                      anr

Zirconium              10                      .3

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element in the area bracketed by this QC.

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:		12:21 ICV1		12:34 CCV1		13:33 CCV2			
Metal	ICV	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum									
Antimony	anr								
Arsenic	2000	1980	99.0	2000	1960	98.0	2000	1930	96.5
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium									
Cerium									
Chromium									
Cobalt									
Copper	anr								
Iron	40000	40700	101.8	40000	39300	98.3	40000	38700	96.8
Lead	anr								
Lithium									
Magnesium									
Manganese	anr								
Molybdenum									
Nickel	anr								
Phosphorus									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Sulfur									
Thallium	anr								
Tin	anr								
Titanium									
Tungsten									
Vanadium									

6.1.4  
6

90-110

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		12:21			12:34			13:33		
Sample ID:	ICV	ICV1	CCV		CCV1	CCV		CCV2		
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28		15:27			
Sample ID:	CCV	CCV3		CCV	CCV4		
Metal	True	Results	% Rec	True	Results	% Rec	
Aluminum							
Antimony	anr						
Arsenic	2000	1880	94.0	2000	1840	92.0	
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							90-110
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	40000	37700	94.3	40000	36600	91.5	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Sulfur							
Thallium	anr						
Tin	anr						
Titanium							
Tungsten							
Vanadium							

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 95 to 105 % Recovery      Run ID: MA52515      Units: ug/l

Time:		14:28			15:27		
Sample ID:	CCV	CCV3	CCV		CCV4		
Metal	True	Results	% Rec	True	Results	% Rec	

Zinc                      anr

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

6.1.4  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03		13:09	
Sample ID:	HSTD	HSTD1	HSTD	HSTD2	
Metal	True	Results	% Rec	True	Results
Aluminum					
Antimony	anr				
Arsenic	8000	7450	93.1		
Barium	anr				
Beryllium	anr				
Bismuth					
Boron					
Cadmium	anr				
Calcium					90-110
Cerium					
Chromium					
Cobalt					
Copper	anr				
Iron			200000	186000	93.0
Lead	anr				
Lithium					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Sulfur					
Thallium	anr				
Tin	anr				
Titanium					
Tungsten					
Vanadium					

6.1.5  
6

# HIGH STANDARD CHECK SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: 90 to 110 % Recovery Run ID: MA52515 Units: ug/l

Time:		13:03		13:09	
Sample ID:		HSTD1		HSTD2	
Metal	HSTD	Results	% Rec	Results	% Rec

Zinc anr

Zirconium

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.5  
6

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	12:43 CRID1	12:48 CRI1	14:38 CRI2
Metal	True	True	True	Results % Rec	Results % Rec	Results % Rec
Aluminum	200	500	100			
Antimony	6.0	20	3.0			
Arsenic	8.0	20	3.0	3.50 116.7 ✓	7.80 97.5 ✓	7.50 93.8 ✓
Barium	200		4.0	anr		
Beryllium	2.0		1.0	anr		
Bismuth	20					
Boron	100		10			
Cadmium	3.0		1.0	anr		
Calcium	5000	2000	1000			
Cerium						
Chromium	10		2.0			
Cobalt	50		3.0			
Copper	10		2.0			
Iron	100	500			99.3 99.3 ✓	95.5 95.5 ✓
Lead	3.0	20	2.5			
Lithium	50					
Magnesium	5000	2000	100			
Manganese	15		3.0	anr		
Molybdenum	20					
Nickel	10		4.0	anr		
Phosphorus	50					
Potassium	5000		2000	anr		
Selenium	10	20	5.0			
Silicon	200					
Silver	5.0		2.0			
Sodium	5000		1000	anr		
Strontium	10					
Sulfur	50					
Thallium	10		2.0			
Tin	10					
Titanium	10					
Tungsten	50					
Vanadium	50		2.0			

70-130 ✓

6.1.6

6



LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:					12:43		12:48		14:38	
Sample ID:	CRI	CRIA	CRID	CRID1	Results	% Rec	Results	% Rec	Results	% Rec
Metal	True	True	True							

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time: Sample ID:	CRI	CRIA	CRID	14:43 CRID2	% Rec
Metal	True	True	True	Results	
Aluminum	200	500	100		
Antimony	6.0	20	3.0		
Arsenic	8.0	20	3.0	3.10	103.3
Barium	200		4.0	anr	
Beryllium	2.0		1.0	anr	
Bismuth	20				
Boron	100		10		
Cadmium	3.0		1.0	anr	
Calcium	5000	2000	1000		
Cerium					
Chromium	10		2.0		
Cobalt	50		3.0		
Copper	10		2.0		
Iron	100	500			
Lead	3.0	20	2.5		
Lithium	50				
Magnesium	5000	2000	100		
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Phosphorus	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0		
Silicon	200				
Silver	5.0		2.0		
Sodium	5000		1000	anr	
Strontium	10				
Sulfur	50				
Thallium	10		2.0		
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0		

70-130

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
 QC Limits: CRI 80-120% CRIA 80-120% Run ID: MA52515 Units: ug/l

Time:				14:43	
Sample ID:	CRI	CRIA	CRID	CRID2	
Metal	True	True	True	Results	% Rec

Zinc 20 10 anr

Zirconium 10

(\*) Outside of QC limits  
 (anr) Analyte not requested

6.1.6  
6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP      Date Analyzed: 06/03/22      Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery      Run ID: MA52515      Units: ug/l

Time: Sample ID:	ICSA True	ICSAB True	12:53 ICSAB1 Results	% Rec	12:58 ICSAB1 Results	% Rec	14:48 ICSAB2 Results	% Rec	14:53 ICSAB2 Results	% Rec
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	478000	95.6	471000	94.2	455000	91.0	458000	91.6
Antimony		1000	1.90		927	92.7	4.20		899	89.9
Arsenic		1000	-1.30		940	94.0	-1.00		904	90.4
Barium		500	5.90		465	93.0	5.40		447	89.4
Beryllium		500	0.200		461	92.2	0.200		449	89.8
Bismuth		500	-16.3		470	94.0	-16.8		449	89.8
Boron		500	0.500		465	93.0	-0.200		448	89.6
Cadmium		1000	-0.800		981	98.1	-1.20		944	94.4
Calcium	400000	400000	377000	94.3	376000	94.0	357000	89.3	364000	91.0
Cerium			144*		605*		141*		584*	
Chromium		500	5.40		465	93.0	4.60		451	90.2
Cobalt		500	1.10		469	93.8	1.30		453	90.6
Copper		500	1.20		482	96.4	1.10		470	94.0
Iron	200000	200000	197000	98.5	192000	96.0	189000	94.5	185000	92.5
Lead		1000	1.70		901	90.1	-1.90		873	87.3
Lithium		500	-5.50		455	91.0	-8.10		437	87.4
Magnesium	500000	500000	479000	95.8	477000	95.4	464000	92.8	462000	92.4
Manganese		500	-1.90		483	96.6	-2.30		468	93.6
Molybdenum		500	-2.80		454	90.8	-2.30		437	87.4
Nickel		1000	-3.70		896	89.6	-3.90		866	86.6
Phosphorus		500	-2.40		451	90.2	-2.00		433	86.6
Potassium			-601		-590		-606		-567	
Selenium		1000	-4.50		875	87.5	0.800		846	84.6
Silicon		500	3.40		505	101.0	4.10		489	97.8
Silver		1000	1.50		947	94.7	0.200		921	92.1
Sodium			110		127		149		126	
Strontium		500	-0.900		464	92.8	-0.800		448	89.6
Sulfur		500	24.0		484	96.8	20.5		474	94.8
Thallium		1000	-3.70		882	88.2	-2.90		852	85.2
Tin		500	-5.70		450	90.0	-5.50		436	87.2
Titanium		500	-1.80		471	94.2	-1.60		457	91.4
Tungsten		500	-2.30		462	92.4	-2.50		443	88.6
Vanadium		500	1.70		474	94.8	2.50		460	92.0

6.1.7  
6

80-120

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

File ID: SC060322M1.ICP Date Analyzed: 06/03/22 Methods: EPA 200.7, SW846 6010D  
QC Limits: 80 to 120 % Recovery Run ID: MA52515 Units: ug/l

Time:				12:53			12:58			14:48			14:53
Sample ID:	ICSAB	ICSAB	ICSAB	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB1	ICSAB2	ICSAB2	ICSAB2	ICSAB2
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec

Zinc		1000	-3.40			906	90.6	-3.10		874	87.4		
Zirconium		500	-7.00			428	85.6	-7.00		415	83.0		

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/02/22

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	17	150		
Antimony	6.0	1.7	4.7		
Arsenic	3.0	2.1	2.8	-0.40	<3.0
Barium	200	.8	13		
Beryllium	1.0	.3	.5		
Bismuth	20	2.3	8.6		
Boron	100	2.3	10		
Cadmium	3.0	.3	1		
Calcium	5000	6.6	99		
Cerium	100				
Chromium	10	.3	2		
Cobalt	50	.4	2.6		
Copper	10	.8	5.9		
Iron	100	5.3	32	4.8	<100
Lead	3.0	1.1	1.8		
Lithium	50	4.8	7.3		
Magnesium	5000	32	140		
Manganese	15	.1	1.4		
Molybdenum	20	.6	3.6		
Nickel	10	.4	1.7		
Phosphorus	50	1.2	18		
Potassium	10000	77	200		
Selenium	10	3.2	4.9		
Silicon	200	1.7	32		
Silver	10	1	6.1		
Sodium	10000	34	570		
Strontium	10	.3	2.7		
Sulfur	50	3	45		
Thallium	10	1.8	1.8		
Tin	10	.8	3.7		
Titanium	10	.5	2.5		
Tungsten	50	2.6	40		
Vanadium	50	.6	1.8		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JD45654  
Account: SUNOCOSS - Sunoco/Evergreen  
Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
Matrix Type: AQUEOUS

Methods: SW846 6010D  
Units: ug/l

Prep Date: 06/02/22

Metal	RL	IDL	MDL	MB raw	final
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Zinc 20 .1 6.9

Zirconium 10 .3 4.1

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	14600	16400	2000	90.0 75-125 4x no eval
Barium	anr			
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	52800	79000	25000	104.8 75-125
Lead	anr			
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin	anr			
Titanium				
Tungsten				
Vanadium				



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MS	Spikelet MPSPK2	% Rec	QC Limits
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Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original	MSD	Spikelet MPSPK2	% Rec	MSD RPD	QC Limit	
Aluminum							
Antimony							
Arsenic	14600	16800	2000	110.0	2.4	20	4x no eval
Barium	anr						
Beryllium							
Bismuth							
Boron							
Cadmium	anr						
Calcium							
Cerium							
Chromium							
Cobalt							
Copper	anr						
Iron	52800	79600	25000	107.2	0.8	20	
Lead	anr						
Lithium							
Magnesium							
Manganese	anr						
Molybdenum							
Nickel	anr						
Phosphorus							
Potassium							
Selenium	anr						
Silicon							
Silver							
Sodium	anr						
Strontium							
Sulfur							
Thallium							
Tin	anr						
Titanium							
Tungsten							
Vanadium							

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F Original MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
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Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45654

Account: SUNOCOSS - Sunoco/Evergreen

Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220

Methods: SW846 6010D

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

06/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1870	2000	93.5	80-120
Barium	anr			
Beryllium				
Bismuth				
Boron				
Cadmium	anr			
Calcium				
Cerium				
Chromium				
Cobalt				
Copper	anr			
Iron	24700	25000	98.8	80-120
Lead	anr			
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium				
Tin	anr			
Titanium				
Tungsten				
Vanadium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	BSP Result	Spikelot MPSPK2	% Rec	QC Limits
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Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F	QC
Original	SDL 5:25 %DIF	Limits
Aluminum		
Antimony		
Arsenic	14600 14700	0.8 0-10
Barium	anr	
Beryllium		
Bismuth		
Boron		
Cadmium	anr	
Calcium		
Cerium		
Chromium		
Cobalt		
Copper	anr	
Iron	52800 54500	3.2 0-10
Lead	anr	
Lithium		
Magnesium		
Manganese	anr	
Molybdenum		
Nickel	anr	
Phosphorus		
Potassium		
Selenium	anr	
Silicon		
Silver		
Sodium	anr	
Strontium		
Sulfur		
Thallium		
Tin	anr	
Titanium		
Tungsten		
Vanadium		

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD45654  
 Account: SUNOCOSS - Sunoco/Evergreen  
 Project: SANHPAFW: Marcus Hook, PA

QC Batch ID: MP33220  
 Matrix Type: AQUEOUS

Methods: SW846 6010D  
 Units: ug/l

Prep Date: 06/02/22

Metal	JD45654-2F	QC
	Original SDL 5:25 %DIF	Limits

Zinc anr

Zirconium

Associated samples MP33220: JD45654-1F, JD45654-2F, JD45654-3F, JD45654-4F

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

6.2.4


6

## **Appendix D**


### **Low Flow Groundwater Sampling Forms**




# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/24/2022		<b>Well:</b> MW-509	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-509_20220524		<b>Ref Elev:</b> 12.36 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> NA		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba U-52				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(3L)		<b>Screen Range:</b> -4.7 - 5.3 ft	
<b>SN:</b> LOPARLRU				<b>Collector(s):</b> AB						<b>Well Diameter:</b> 4 in	
<b>Purge/Sample Method:</b> Low flow				<b>Weather:</b> Overcast				<b>Initial DTW:</b> 4.90 ft ref		<b>Depth to Bottom:</b> 13.2	
<b>Purge Volume (gal):</b> 1.65				<b>Air Temp (deg F):</b> 60				<b>Initial GW Elev:</b> 7.46 ft amsl		<b>Sample Depth:</b> 9	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
12:45	250	5.20	7.16	18.71	6.93	-108	1,050	17.10	1.78	Clear	
12:50	250	5.20	7.16	18.37	6.90	-112	1,020	14.90	1.97	Clear	
12:55	250	5.20	7.16	17.83	6.83	-116	976	10.20	1.70	Clear	
13:00	250	5.20	7.16	17.48	6.80	-121	996	8.20	1.51	Clear	
13:05	250	5.20	7.16	17.59	6.78	-119	993	6.70	1.43	Clear	


# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/24/2022		<b>Well:</b> MW-509D	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-509D_20220524		<b>Ref Elev:</b> 12.63 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> NA		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba U-52				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(3L)		<b>Screen Range:</b> -19.62 - -9.62 ft	
<b>SN:</b> LOPARLRU				<b>Collector(s):</b> AB						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Low flow				<b>Weather:</b> Low 60s Overcast				<b>Initial DTW:</b> 11.35 ft ref		<b>Depth to Bottom:</b> 32.5	
<b>Purge Volume (gal):</b> 0.37				<b>Air Temp (deg F):</b> 60				<b>Initial GW Elev:</b> 1.28 ft amsl		<b>Sample Depth:</b> 25	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
12:00	200	11.45	1.18	20.97	6.22	-91	6,550	168.00	3.15	Clear	
12:05	200	11.45	1.18	20.41	6.26	-114	6,710	156.00	1.88	Clear	
12:10	200	11.45	1.18	19.37	6.28	-129	6,870	145.00	1.68	Clear	
12:15	200	11.45	1.18	18.87	6.29	-134	6,940	135.00	1.59	Clear	
12:20	200	11.45	1.18	18.59	6.30	-135	6,890	136.00	1.61	Clear (collection tote slight yellow)	


# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/25/2022		<b>Well:</b> MW-531L	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-531L_20220525		<b>Ref Elev:</b> 9.85 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> NA				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Dissolved As/Fe, Sulfate/Sulfide		<b>Screen Range:</b> -19.99 - -9.69 ft	
<b>SN:</b> NA				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Peristaltic Pump				<b>Weather:</b> Low 60s Overcast				<b>Initial DTW:</b> NA		<b>Depth to Bottom:</b> 29.45	
<b>Purge Volume (gal):</b> 0.67				<b>Air Temp (deg F):</b> 60				<b>Initial GW Elev:</b> #VALUE!		<b>Sample Depth:</b> 28	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
13:45	500			17.12	6.84	-112	4,890	273.00	0.52	Purged for 5 minutes then sampled.	
										Well has trace product	

# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/25/2022		<b>Well:</b> MW-532L	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-532L_20220525		<b>Ref Elev:</b> 12.88 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> MW-532L_FD_20220525		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba U-52				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Dissolved As/Fe, Sulfate/Sulfide, MS/MSD/FD (dissolved As/Fe only)		<b>Screen Range:</b> -19.52 - -9.82 ft	
<b>SN:</b> 3530-1440				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Low Flow				<b>Weather:</b> Overcast				<b>Initial DTW:</b> 11.35 ft ref		<b>Depth to Bottom:</b> 32.6	
<b>Purge Volume (gal):</b> 2.77				<b>Air Temp (deg F):</b> 70s				<b>Initial GW Elev:</b> 1.53 ft amsl		<b>Sample Depth:</b> 27	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
14:25	300	10.96	1.92								
14:30	300	10.96	1.92	16.49	7.20	-184	6,070	119.00	0.00		
14:35	300	10.95	1.93	16.08	7.10	-201	5,970	97.50	0.00		
14:40	300	10.56	2.32	16.04	7.06	-205	5,980	92.60	0.00		
14:45	300	10.55	2.33	16.15	7.04	-207	5,940	86.10	0.00		
14:50	300	10.55	2.33	16.09	7.02	-209	5,920	74.50	0.00		
14:55	300	10.55	2.33	16.00	7.01	-210	5,900	72.70	0.00		
15:00	300	10.55	2.33	16.05	7.00	-212	5,890	71.20	0.00		

# Groundwater Quality Field Sampling Summary


				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/24/2022		<b>Well:</b> MW-533L	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-533L_20220524		<b>Ref Elev:</b> 11.38 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(3L)		<b>Screen Range:</b> -19.88 - -9.88 ft	
<b>SN:</b> 3530-1440				<b>Collector(s):</b> AB						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Low flow				<b>Weather:</b> Overcast				<b>Initial DTW:</b> 8.05 ft ref		<b>Depth to Bottom:</b> 33	
<b>Purge Volume (gal):</b> 1.95				<b>Air Temp (deg F):</b> 60s				<b>Initial GW Elev:</b> 3.33 ft amsl		<b>Sample Depth:</b> 25	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
14:15	300	8.50	2.88	15.93	6.91	9	1,030	26.10	2.40		
14:20	300	8.22	3.16	15.67	6.68	20	1,030	68.30	0.00		
14:25	300	8.54	2.84	16.16	6.55	24	1,040	64.00	0.00		
14:30	300	8.50	2.88	16.20	6.50	25	1,040	48.60	0.00		
14:35	300	8.52	2.86	16.15	6.47	27	1,040	41.30	0.00		

[illegible]

# Groundwater Quality Field Sampling Summary

<div>SANBORN</div> <div></div> <div>HEAD</div>				Project Name: Evergreen AOI 7 MHIC				Sample Date: 5/26/2022		Well: MW-559D	
				Project Number: 4862.04				Sample Name: MW-559D_20220526		Ref Elev: 12.50 ft	
				Project Location: Marcus Hook, PA				Duplicate ID: None		Ref Type: TIC	
Multiparameter Probe: Horiba				Project Manager: Chelsey Shepsko				Analysis: Dissolved As/Fe, Sulfate/Sulfide		Screen Range: NA	
SN: 3530-1440				Collector(s): AB						Well Diameter: 2 in	
Purge/Sample Method: Low Flow				Weather: Partly sunny				Initial DTW: 10.70 ft ref		Depth to Bottom: 32.5	
Purge Volume (gal): 3.7				Air Temp (deg F): 65				Initial GW Elev: 1.80 ft amsl		Sample Depth: 29	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
10:20	250	11.07	1.43	18.24	6.40	-81	4,770	1000.00	2.87	Cloudy	
10:25	250	11.34	1.16	17.74	6.32	-87	4,750	1000.00	1.27	Cloudy	
10:30	250	11.75	0.75	16.92	6.45	-108	4,750	648.00	1.00	Clearing	
10:35	250	11.55	0.95	17.17	6.39	-106	4,740	404.00	0.92	Clearing	
10:40	250	11.55	0.95	17.25	6.40	-107	4,730	379.00	0.89	Clear	
10:45	250	11.55	0.95	17.30	6.41	-108	4,750	184.00	0.76	Clear	
10:50	250	11.55	0.95	15.97	6.41	-109	4,780	95.00	0.81	Clear	
10:55	250	11.55	0.95	15.85	6.48	-115	4,920	83.50	0.82	Clear	
11:00	250	11.55	0.95	15.80	6.48	-115	4,890	67.20	0.77	Clear	
11:05	250	11.55	0.95	15.87	6.50	-112	4,890	67.80	0.78	Clear	
11:10	250	11.55	0.95	15.90	6.48	-111	4,930	67.20	0.74	Clear	

# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/26/2022		<b>Well:</b> MW-560	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-560_20220526		<b>Ref Elev:</b> 8.89 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(3L)		<b>Screen Range:</b> -8.56 - 1.44 ft	
<b>SN:</b> 3530-1440				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Low Flow				<b>Weather:</b> Partly Sunny				<b>Initial DTW:</b> 7.20 ft ref		<b>Depth to Bottom:</b> 17	
<b>Purge Volume (gal):</b> 2.7				<b>Air Temp (deg F):</b> 67				<b>Initial GW Elev:</b> 1.69 ft amsl		<b>Sample Depth:</b> 12	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
9:00	400	7.60	1.29	13.41	3.10	468	1,170	360.00	4.12	Slight rust color	
09:05	400	7.60	1.29	12.72	3.12	500	1,200	358.00	3.80	Slight rust color	
9:10	400	7.60	1.29	12.62	3.36	495	1,260	36.20	3.73	Clearing	
9:15	400	7.60	1.29	12.73	3.37	458	1,370	72.00	2.91	Clear	
9:20	400	7.60	1.29	12.70	3.37	453	1,270	88.00	2.98	Clear	



# Groundwater Quality Field Sampling Summary

<div>SANBORN<div><div></div><div></div><div></div><div></div></div>HEAD</div>				Project Name: Evergreen AOI 7 MHIC				Sample Date: 5/26/2022		Well: MW-560D	
				Project Number: 4862.04				Sample Name: MW-560D_20220526		Ref Elev: 10.22 ft	
				Project Location: Marcus Hook, PA				Duplicate ID: None		Ref Type: TIC	
Multiparameter Probe: Horiba				Project Manager: Chelsey Shepsko				Analysis: Bench(5L), dissolved As/Fe, Sulfate/Sulfide		Screen Range: NA	
SN: 3530-1440				Collector(s): MF						Well Diameter: 2 in	
Purge/Sample Method: Monsoon				Weather: Cloudy				Initial DTW: 8.71 ft ref		Depth to Bottom: 34.62	
Purge Volume (gal): 5.5				Air Temp (deg F): 60				Initial GW Elev: 1.51 ft amsl		Sample Depth: 22	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
9:05	300	9.01	1.21						0.00		
9:10	300	9.01	1.21	14.92	5.96	-67	3,610	0.00	0.00		
9:15	300	9.01	1.21	14.92	6.04	-90	2,950	843.00	0.00		
9:20	300	9.01	1.21	14.97	6.06	-95	2,740	454.00	0.00		
9:25	300	9.01	1.21	14.85	6.07	-98	2,690	317.00	0.00		
9:30	300	9.01	1.21	14.92	6.08	-100	2,530	212.00	0.00		
9:35	300	9.01	1.21	14.93	6.15	-102	2,470	168.00	0.00		
9:40	300	9.01	1.21	14.96	6.10	-104	2,380	119.00	0.00		
9:45	300	9.01	1.21	14.90	6.11	-105	2,320	98.80	0.00		
9:50	300	9.01	1.21	14.93	6.11	-106	2,210	74.50	0.00		
9:55	300	9.01	1.21	14.91	6.11	-106	2,140	52.50	0.00		
10:00	300	9.01	1.21	14.94	6.11	-106	2,080	33.80	0.00		
10:05	300	9.01	1.21	15.03	6.15	-107	2,050	35.20	0.00		
10:10	300	9.01	1.21	14.95	6.13	-107	2,030	32.90	0.00		


# Groundwater Quality Field Sampling Summary

<div> <div>SANBORN</div> <div> <div></div> <div>HEAD</div> </div> </div>				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/25/2022		<b>Well:</b> MW-606S	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-606S_20220525		<b>Ref Elev:</b> 17.77 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(SL)		<b>Screen Range:</b> -4.49 - 5.51 ft	
<b>SN:</b> 3530-1440				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Monsoon				<b>Weather:</b> Cloudy				<b>Initial DTW:</b> 15.36 ft ref		<b>Depth to Bottom:</b> 22.59	
<b>Purge Volume (gal):</b> 2.5				<b>Air Temp (deg F):</b> 60				<b>Initial GW Elev:</b> 2.41 ft amsl		<b>Sample Depth:</b> 19.5	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
9:10	200	15.49	2.28								
9:15	200	15.49	2.28	15.83	6.68	-118	4,640	554.00	0.00		
9:20	200	15.49	2.28	15.83	6.61	-123	4,690	122.00	0.00		
9:25	200	15.49	2.28	15.51	6.59	-124	4,710	71.30	0.00		
9:30	200	15.49	2.28	15.54	6.58	-125	4,690	37.70	0.00		
9:35	200	15.49	2.28	15.75	6.58	-126	4,690	20.10	0.00		
9:40	200	15.49	2.28	15.68	6.57	-127	4,690	18.90	0.00		
9:45	200	15.49	2.28	15.88	6.57	-127	4,690	13.80	0.00		
9:50	200	15.49	2.28	15.82	6.59	-128	4,700	12.90	0.00		
9:55	200	15.49	2.28	15.78	6.59	-128	4,700	12.60	0.00	Sample Collected	


# Groundwater Quality Field Sampling Summary

<div>SANBORN<div><div></div><div></div><div></div></div>HEAD</div>				Project Name: Evergreen AOI 7 MHIC				Sample Date: 5/25/2022		Well: MW-606D	
				Project Number: 4862.04				Sample Name: MW-606D_20220525		Ref Elev: 17.87 ft	
				Project Location: Marcus Hook, PA				Duplicate ID: None		Ref Type: TIC	
Multiparameter Probe: Horiba				Project Manager: Chelsey Shepsko				Analysis: Dissolved As/Fe, Sulfate/Sulfide		Screen Range: -19.49 - -9.49 ft	
SN: LOPARLRU				Collector(s): MF						Well Diameter: 2 in	
Purge/Sample Method: Monsoon				Weather: Sunny				Initial DTW: 15.74 ft ref		Depth to Bottom: 35.94	
Purge Volume (gal): 4.1				Air Temp (deg F): 70				Initial GW Elev: 2.13 ft amsl		Sample Depth: 32	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
10:20	400	15.34	2.53								
10:25	400	17.51	0.36	16.26	6.51	-138	14,900	625.00	0.00	Yellowish-green water in purge bucket	
10:30	100	17.33	0.54	16.43	6.53	-146	14,900	435.00	0.00		
10:35	100	17.17	0.70	16.61	6.53	-150	15,000	333.00	0.00	Foam forming in purge bucket	
10:40	100	17.20	0.67	16.86	6.54	-153	14,800	257.00	0.00		
10:45	200	17.22	0.65	16.81	6.54	-154	14,700	199.00	0.00		
10:50	200	17.24	0.63	16.80	6.53	-155	14,600	156.00	0.00		
10:55	200	17.20	0.67	16.65	6.53	-155	14,500	133.00	0.00		
11:00	200	17.26	0.61	16.57	6.53	-155	14,500	102.00	0.00		
11:05	300	17.26	0.61	16.49	6.52	-155	14,300	98.40	0.00		
11:10	300	17.30	0.57	16.78	6.51	-154	14,200	85.70	0.00		
11:15	300	17.30	0.57	16.61	6.51	-154	14,200	80.90	0.00		
11:20	300	17.33	0.54	16.63	6.50	-152	14,300	78.90	0.00		


# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/26/2022		<b>Well:</b> MW-607D	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-607D_20220526		<b>Ref Elev:</b> 14.23 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> None				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Dissolved As/Fe, Sulfate/Sulfide		<b>Screen Range:</b> -18.53 - -8.53 ft	
<b>SN:</b> None				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Peristaltic Pump				<b>Weather:</b> Sunny				<b>Initial DTW:</b> NA		<b>Depth to Bottom:</b> 33.43	
<b>Purge Volume (gal):</b> 0.8				<b>Air Temp (deg F):</b> 74				<b>Initial GW Elev:</b> #VALUE!		<b>Sample Depth:</b> 29	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
8:00	450			15.89	7.16	-197	3,640	303.00	0.52	Purged for 5 minutes then sampled.	
										Well has trace product	

# Groundwater Quality Field Sampling Summary

				<b>Project Name:</b> Evergreen AOI 7 MHIC				<b>Sample Date:</b> 5/24/2022		<b>Well:</b> MW-608D	
				<b>Project Number:</b> 4862.04				<b>Sample Name:</b> MW-608D_20220524		<b>Ref Elev:</b> 23.47 ft	
				<b>Project Location:</b> Marcus Hook, PA				<b>Duplicate ID:</b> None		<b>Ref Type:</b> TIC	
<b>Multiparameter Probe:</b> Horiba				<b>Project Manager:</b> Chelsey Shepsko				<b>Analysis:</b> Bench(5L), dissolved As/Fe		<b>Screen Range:</b> NA	
<b>SN:</b> 3530-1440				<b>Collector(s):</b> MF						<b>Well Diameter:</b> 2 in	
<b>Purge/Sample Method:</b> Monsoon				<b>Weather:</b> Cloudy				<b>Initial DTW:</b> 21.48 ft ref		<b>Depth to Bottom:</b> 44.1	
<b>Purge Volume (gal):</b> 1				<b>Air Temp (deg F):</b> 60				<b>Initial GW Elev:</b> 1.99 ft amsl		<b>Sample Depth:</b> 35	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
8:55	400	21.24	2.23							Yellowish green water; odor	
9:00	300	23.52	-0.05	15.67	6.96	-166	6,310	168.00	0.00		
9:05	300	23.99	-0.52	15.85	6.97	-179	6,410	1110.00	0.00		
9:10	400	25.01	-1.54	15.65	6.95	-185	6,440	80.50	0.00		
9:15	400	24.58	-1.11	15.87	6.93	-181	6,380	202.00	0.00		
9:20	400	26.91	-3.44	15.69	6.91	-186	6,390	195.00	0.00	Iron floc in purge bucket	
9:25	400	27.20	-3.73	15.70	6.89	-190	6,370	190.00	0.00	Sample Collected	

# Groundwater Quality Field Sampling Summary

SANBORN  HEAD				Project Name: Evergreen AOI 7 MHIC				Sample Date: 5/24/2022		Well: MW-609D	
				Project Number: 4862.04				Sample Name: MW-609D_20220524		Ref Elev: 22.62 ft	
				Project Location: Marcus Hook, PA				Duplicate ID: None		Ref Type: TIC	
Multiparameter Probe: Horiba				Project Manager: Chelsey Shepsko				Analysis: Bench(5L), dissolved As/Fe		Screen Range: NA	
SN: 3530-1440				Collector(s): MF						Well Diameter: 2 in	
Purge/Sample Method: Monsoon				Weather: Cloudy				Initial DTW: 21.86 ft ref		Depth to Bottom: 43.6	
Purge Volume (gal): 3.9				Air Temp (deg F): 60				Initial GW Elev: 0.76 ft amsl		Sample Depth: 31	
Sample Time	Flow Rate	Depth to Water	GW Elev	Temp	pH	ORP	SpecCond	Turbidity	Dissolved Oxygen	Comment	
HH:MM	ml/min	ft ref	ft amsl	deg C	SU	mV	uS/cm	NTU	mg/L		
10:55	200	22.09	0.53								
11:00	200	21.93	0.69	17.92	6.94	-176	5,530	530.00	0.00		
11:05	200	21.97	0.65	17.74	6.90	-181	5,520	497.00	0.00		
11:10	200	22.14	0.48	17.66	6.90	-184	5,510	455.00	0.00		
11:15	200	22.49	0.13	17.42	6.89	-187	5,480	335.00	0.00	Iron floc in purge buckrt	
11:20	200	22.49	0.13	17.70	6.84	-186	5,530	123.00	0.00		
11:25	200	22.47	0.15	17.36	6.83	-187	5,510	88.90	0.00		
11:30	200	22.54	0.08	17.17	6.85	-189	5,540	87.50	0.00		
11:35	400	24.43	-1.81	16.12	6.83	-189	5,520	126.00	0.00		
11:40	300	23.15	-0.53	16.19	6.82	-186	5,600	106.00	0.00		
11:45	300	22.88	-0.26	16.36	6.81	-189	5,610	50.10	0.00		
11:50	300	22.88	-0.26	16.38	6.81	-189	5,620	28.00	0.00		
11:55	300	22.85	-0.23	16.52	6.81	-191	5,610	25.90	0.00		
12:00	300	22.93	-0.31	16.45	6.81	-191	5,620	26.30	0.00		


## **Appendix E**

### **Reagent Specifications and Safety Data Sheets**

### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

- 1.1 Product identifier**  
 Product Name REMOTOX®  
 Chemical Name Calcium Polysulfide Solution  
 Chemical Family Inorganic Salt  
 CAS-No. 1344-81-6
- 1.2 Recommended use of the substance or mixture**  
 Identified Uses Industrial use. Heavy metal fixation reagent.
- 1.3 Details of the supplier of the safety data sheet**  
 Company Graus Chemicals, LLC  
 P.O. Box 768  
 Carefree, AZ 85377  
[info@grauschemicals.com](mailto:info@grauschemicals.com)
- 1.4 Emergency phone number** 1-623-328-5175

### SECTION 2: HAZARD(S) IDENTIFICATION

- 2.1 Classification of the substance or mixture**  
 Acute toxicity – oral Category 4  
 Acute toxicity – dermal Category 4  
 Acute toxicity – inhalation Category 4  
 Skin corrosion/irritation Category 2  
 Eye damage/irritation Category 1
- 2.2 GHS-US labeling**  
 Signal word Danger!
- Hazard statement(s)  
 H302 Harmful if swallowed.  
 H315 Causes skin irritation.  
 H318 Causes serious eye damage.  
 H332 Harmful if inhaled.
- Symbol(s)  

- Precautionary statement(s)  
 P221 Take any precaution to avoid mixing with combustibles/acids/oxidizers.  
 P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.  
 P262 Do not get in eyes, on skin, or on clothing.  
 P264 Wash thoroughly after handling.  
 P233 Keep containers tightly closed.  
 P271 Use only outdoors or in a well-ventilated area.  
 P273 Avoid release to the environment – if this is not the intended use.  
 P280 Wear protective gloves/eye protection/face shield.  
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- Unclassified hazard(s) Aquatic Toxicity
- Unknown toxicity ingredient None



## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substance/Mixture

Chemical Name	Synonyms	Formula	CAS No.	EINECS No.	% by weight
Calcium Polysulfide	Lime Sulfur, Calcium Sulfide	CaS <sub>x</sub> /KS <sub>x</sub>	1344-81-6	215-709-2	26-34
Water	Water	H <sub>2</sub> O	7732-18-5	231-791-2	Remaining

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of first aid measures

Eye contact	Rinse immediately (the exposed eyes) with lukewarm, gently flowing water for at least 15-20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get immediate medical advice/attention.
Skin contact	Wash immediately with soap and plenty of water. Rinse for at least 15 minutes. Remove contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention.
Ingestion	Drink immediately a small amount of water or milk. Then call a Poison Control Center or doctor/physician right away. Do not induce vomiting unless instructed by poison control or a medical professional.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get immediate medical advice/attention.

### 4.2 Most important symptoms and effects both acute and delayed

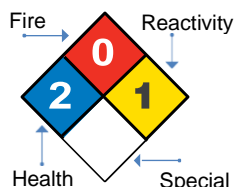
Acute	Eyes: Symptoms may include burns or irritation to the eyes. Skin: Repeated or prolonged contact may cause dryness, cracking and dermatitis. Inhalation: Symptoms may include irritation to the respiratory tract. Ingestion: Symptoms may include burns or irritation of the gastrointestinal tract. Contact with stomach acid can liberate toxic hydrogen sulfide vapors.
Delayed	No known chronic effects.

## SECTION 5: FIRE FIGHTING MEASURES

### 5.1 Flammable properties

National Fire Protection Association (NFPA) Ratings

Health	2
Flammability	0
Reactivity	1
Special	-



HAZARD RATING:

4 SEVERE  
3 SERIOUS  
2 MODERATE  
1 SLIGHT  
0 MINIMAL

### 5.2 Suitable extinguishing media

Use firefighting measures that suit the environment.

### 5.3 Unsuitable extinguishing media

No restrictions known.

### 5.4 Specific hazards arising from the substance or mixture

Closed/sealed containers may rupture violently when heated. In a fire, the following hazardous materials may be generated: hydrogen sulfide (H<sub>2</sub>S) gas.

### 5.5 Protective equipment or precautions for firefighters

Firefighters should wear self-contained breathing apparatus (SCBA) and full firefighting turnout gear. Keep containers and storage vessels in the fire area cooled with water spray.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions

Wear protective equipment specified in Section 8. Isolate the release area and deny entry to unnecessary personnel.

### 6.2 Environmental precautions

Avoid release to the environment – if this is not the intended use. Dike spills and stop leakage where practical.

### 6.3 Methods and materials for containment and cleaning up

Small releases	Use absorbent material to collect and contain for salvage or disposal. Clean surface thoroughly to remove residual spill.
Large releases	Shut off release if safe to do so. Dike spill area with earth, sand or other inert absorbents to prevent runoff into surface waterways or drains. Recover as much of the released product as possible, using portable pump and hoses, and place into container(s) for later disposal. Following product recovery, flush area with water.

## SECTION 7: HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Wear suitable protective clothing, gloves and eye/face protection. Use only in a well ventilated area. Avoid contact with skin and eyes. Avoid prolonged or repeated breathing of vapors. Wash skin thoroughly after handling.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in well ventilated area and away from combustibles, acids and oxidizing agents. Keep away from heat. Keep containers tightly closed and store out of direct sunlight at a moderate temperature.

## SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION

### 8.1 Occupational exposure limits

No exposure limits noted.

### 8.2 Engineering controls

Good ventilation should be used. Ventilation rates should be matched to site conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station where material is frequently handled.

### 8.3 Personal protection measures



#### Eye Protection

Wear chemical goggles/full face shield. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).



#### Skin Protection

Wear neoprene rubber gloves and chemical protection suit to prevent repeated or prolonged contact with material. Use protective clothing tested and approved under appropriate government standards such as NIOSH (US) or Directive 89/686/EEC (EU).



#### Respiratory Protection

Have self-contained breathing apparatus (SCBA) positive pressure, available in case of accidental release, equipment failure or other unforeseen incidents. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or EN 166 EU.



#### General Hygiene Considerations

Wash thoroughly after handling and before eating, drinking or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Appearance	Deep red-yellow liquid
------------	------------------------

Upper/lower flammability limits	Not applicable
Odor	Slight rotten egg odor
Vapor pressure	Not determined
Odor threshold	4.7 ppb (hydrogen sulfide)
Vapor density	Not determined
pH	10.5-11.5
Relative density	1.27 g/cc or 10.6 lbs/gal
Melting point	Not applicable
Freezing point	18-25 °F (-7.7 to -3.9 °C)
Solubility	Completely soluble in water
Initial Boiling point/range	Not determined
Flash point	Not applicable
Evaporation rate	Not determined
Flammability (solid, gas)	Not applicable
Partition coefficient	No data available
Auto ignition temperature	Not applicable
Decomposition temperature	Not determined
Viscosity	2.95 cSt @ 20 °C, 2.5 cSt @ 30 °C

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 Reactivity

Strong oxidizers and acids.

### 10.2 Chemical stability

Stable under moderate temperature and pressure.

### 10.3 Possibility of hazardous interactions

Acids, acidic materials, and strong oxidizers cause rapid decomposition, resulting in the formation of H<sub>2</sub>S gas.

### 10.4 Conditions to avoid

Fire, excessive heat and freezing conditions.

### 10.5 Incompatible materials

Chemical substances: Acids, acidic materials and oxidizing agents. Materials of construction: Copper, carbon steel, aluminum or their alloys (i.e. brass, bronze, etc.).

### 10.6 Hazardous decomposition products

Hydrogen sulfide and oxides of sulfur.

## SECTION 11: TOXICOLOGICAL INFORMATION

Oral	Rat	LD <sub>50</sub> : 820 mg/kg
Dermal	Rabbit	LD <sub>50</sub> : >2,000 mg/kg
Inhalation	Rat	LC <sub>50</sub> : 3.9 mg/l (4 hr exposure) male rat
		LC <sub>50</sub> : 3.1 mg/l (4 hr exposure) female rat
Eye		Primary eye irritation. Possible risk of irreversible effects.
Carcinogenicity		Not listed in NTP, IARC or by OSHA.
Teratology		No data available.
Reproduction		No data available.
Mutagenicity		No data available.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Ecotoxicity

Green Algae	EC <sub>50</sub> : 16.4 mg/l
Water Flea	EC <sub>50</sub> : 13.7 mg/l
Bluegill	LC <sub>50</sub> : 52.9 mg/l
Fathead Minnow	LC <sub>50</sub> : 42.9 mg/l
Rainbow trout	LC <sub>50</sub> : 8.8 mg/l

Honey Bee	LD <sub>50</sub> : >25 µg ai/Bee
Avian	LD <sub>50</sub> : 560 ai/kg
Bobwhite Quail	LD <sub>50</sub> : 560 ai/kg body wt.

## 12.2 Persistence and degradability

Calcium Polysulfide present in moist soils and/or moist foliage is expected to dissociate rapidly; therefore, run-off and erosion into surface waters, as present calcium polysulfide, should be negligible. (US EPA 2005, RED)

## 12.3 Bioaccumulation potential

Product is not bio-accumulative.

## 12.4 Mobility in soil

No data available.

## 12.5 Other adverse effects

Toxic to aquatic organisms.

# SECTION 13: DISPOSAL CONSIDERATION

## 13.1 Waste treatment methods

Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with the local/regional/national/international regulations.

# SECTION 14: TRANSPORTATION INFORMATION

## 14.1 Basic shipping information

Proper shipping name	Calcium Polysulfide Solution (not regulated by US DOT)
DOT Hazard Class	Not applicable
UN Number	Not applicable
Packing Group	Not applicable
Placard(s)	Not applicable
Labels	Not applicable
Hazardous Substance	No
Reportable quantity	No

## 14.3 USCG Classification

Not determined

## 14.4 International Transportation

IMO	UN3082, Environmentally Hazardous Substance, liquid, n.o.s., (Calcium Polysulfide) 9, PG III, MARINE POLLUTANT
IATA	Not regulated
TDG (Canada)	Not regulated
ADR (Europe)	UN3082, Environmentally Hazardous Substance, liquid, n.o.s., (Calcium Polysulfide) 9, PG III, MARINE POLLUTANT

## 14.5 Emergency Response Guide

Not applicable

## 14.6 ERAP (Canada)

Not applicable

## 14.7 Special Precautions

Not applicable

# SECTION 15: REGULATORY INFORMATION

## 15.1 US Federal Regulations

OSHA	Meets the definition of a hazardous substance under the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200).	
TSCA	Included in the US EPA TSCA Inventory List.	
CERCLA	Reportable quantity: No	
SARA Title III	Extremely Hazardous Substance (EHS): No	
	Section 312 (Tier II) Ratings:	Immediate (acute): Yes
	Fire:	No

Sudden release No  
 Reactivity: No  
 Delayed (chronic) No  
 Not applicable

RCRA  
 CAA (HAP):  
 Section 313 (Form R):  
 Not applicable  
 Not applicable

**15.2 State Regulations** CA Prop 65: Not applicable

**15.3 International Regulations**  
 WHMIS (Canada) Not determined  
 DSL/NDSL (Canada) Listed in NDSL, Record No. 28636

## SECTION 16: OTHER INFORMATION

### 16.1 Use of Substance/Preparation

This material is used for heavy metal removal in soil, groundwater and wastewater. Its use varies depending on the site and remediation technology employed. Therefore, exposure should be evaluated so that appropriate handling practices and training can be established to ensure safe workplace operations.

### 16.2 Abbreviations

ACGIH	American Conference of Gov. Industrial Hygienists	NDSL	Non-Domestic Substance List (Canada)
ADR	Carriage Dangerous Goods by Road (Europe)	OSHA	Occupational Safety Health Administration
CAA	Clean Air Act	PEL	Permissible Exposure Limit
CAS	Chemical Abstracts Service	RCRA	Resource Conservation and Recovery Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act	SARA	Superfund Amendments and Reauthorization Act
DSL	Domestic Substance List (Canada)	STCC	Standard Transportation Commodity Act
ERAP	Emergency Response Assistance Plan (Canada)	STEL	Short Term Exposure Limit
HAP	Hazardous Air Pollution	TDG	Transportation of Dangerous Goods
IATA	International Air Transport Association	TLV	Threshold Limit Value
IMO	International Maritime Organization	WHMIS	Workplace Hazardous Materials Information System (Canada)

Some of the information presented are from sources other than direct test data on the product itself. The information in this Safety Data Sheet (SDS) was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding the correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS may not be applicable. Graus Chemicals reserves the right to revise this SDS periodically as new information becomes available.



## VOLUNTARY PURCHASING GROUPS, INC.

### Safety Data Sheet Hi-Yield Horticultural Hydrated Lime

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#### SECTION 1: Identification

##### Product identifier

Product name	Hi-Yield Horticultural Hydrated Lime
Substance name	Calcium Hydroxide $\text{Ca(OH)}_2$

##### Supplier's details

Name	Voluntary Purchasing Groups, Inc.
Address	230 FM 87 Bonham, TX 75418 USA
Telephone	855-270-4776

##### Emergency phone number(s)

In the event of a medical or chemical emergency contact ChemTel, Inc.  
North American 1-800-255-3924 or worldwide Intl. + 01-813-248-0585

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#### SECTION 2: Hazard identification

##### Classification of the substance or mixture

- Eye damage/irritation (chapter 3.3), Cat. 1
- Skin corrosion/irritation (chapter 3.2), Cat. 2
- Carcinogenicity (chapter 3.6), Cat. 1

##### GHS label elements, including precautionary statements

##### Pictogram



##### Signal word

**Danger**

##### Hazard statement(s)

H318	Causes serious eye damage
H315	Causes skin irritation
H350	May cause cancer

# Safety Data Sheet

## Hi-Yield Horticultural Hydrated Lime

### Precautionary statement(s)

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P264	Wash exposed skin thoroughly after handling.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P405	Store locked up.
P501	Dispose of contents/container in accordance with applicable regulations.

### Other hazards which do not result in classification

No data available.

### Statement regarding ingredients of unknown toxicity (OSHA)

No data available.

---

## SECTION 3: Composition/information on ingredients

### Substances

Substance name	Calcium Hydroxide Ca(OH) <sub>2</sub>
----------------	---------------------------------------

### Hazardous components

#### 1. Calcium Hydroxide

Concentration	94 % (Weight)
CAS no.	1305-62-8

#### 2. Magnesium Oxide

Concentration	1 % (Weight)
---------------	--------------

#### 3. Silica, crystalline (airborne particles of respirable size)

Concentration	1 % (Weight)
CAS no.	14808-60-7

---

## SECTION 4: First-aid measures

### Description of necessary first-aid measures

If inhaled	This product can cause severe irritation of the respiratory system. Move victim to fresh air. Seek medical attention if necessary. If breathing has stopped, give artificial respiration.
In case of skin contact	Contact can cause severe irritation or burning of skin. Wash exposed area with large amounts of soap and water. Wear the proper clothing that

## Safety Data Sheet

### Hi-Yield Horticultural Hydrated Lime

will provide less direct contact with the person's skin. Seek medical attention immediately.

In case of eye contact

Contact can cause severe irritation or burning of eyes, including permanent damage. Do not rub eyes and immediately flush eyes with generous amounts of water for at least 15 minutes. Pull back the eyelid to ensure that all lime dust has been washed out. Seek medical attention immediately.

If swallowed

Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

Personal protective equipment for first-aid responders

Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Keep personnel away from and upwind of fire.

#### **Most important symptoms/effects, acute and delayed**

No data available.

#### **Indication of immediate medical attention and special treatment needed, if necessary**

See first aid information above. Note to Physicians: Provide general supportive measures and treat symptomatically.

---

## **SECTION 5: Fire-fighting measures**

#### **Suitable extinguishing media**

Use media suitable to extinguish surrounding fire.

#### **Specific hazards arising from the chemical**

Hazardous Combustion Products: Calcium Oxide

---

## **SECTION 6: Accidental release measures**

#### **Personal precautions, protective equipment and emergency procedures**

Spill /Leak Procedures:

Do NOT use water on bulk material spills. Lime reacts violently with water, releasing heat. Use proper protective equipment.

Small Spills:

Use dry methods to collect spilled materials. Avoid generating dust. Do not clean up with compressed air. Store collected materials in dry, sealed plastic or metal containers. Residue on surfaces may be water washed.

Large Spills:

Use dry methods to collect spilled materials. Evacuate area downwind of clean-up operations to minimize dust exposure. Store spilled materials in dry, sealed plastic or metal containers. Methods and materials for containment and cleaning up

#### **Environmental precautions**

No data available.

#### **Methods and materials for containment and cleaning up**



# Safety Data Sheet

## Hi-Yield Horticultural Hydrated Lime

### Containment:

For large spills, as much as possible, avoid the generation of dusts. Prevent release to sewers or waterways.

### Cleanup:

Residual amounts of material can be flushed with large amounts of water. Equipment can be washed with either a mild vinegar and water solution, or detergent and water.

---

## SECTION 7: Handling and storage

### Precautions for safe handling

Evacuate persons not wearing protective equipment from the area of the spill until clean-up is complete.

Collect powdered material in the most convenient and safe manner and deposit in sealed containers.

Avoid as much contact with the product as possible.

Ventilate and wash area after the clean-up is complete.

It may be necessary to contain and dispose of Hi-Yield Horticultural Hydrated Lime as a HAZARDOUS WASTE.

Contact your State Department of Environmental Protection or regional office of the Federal EPA for specific recommendation

---

## SECTION 8: Exposure controls/personal protection

### Control parameters

#### 1. Magnesium oxide fume - Total Particulate (CAS: 1309-48-4)

PEL (Inhalation): 15 mg/m<sup>3</sup> (OSHA)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 2. Magnesium oxide fume - Total Particulate (CAS: 1309-48-4)

PEL (Inhalation): 10 mg/m<sup>3</sup> (Cal/OSHA)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 3. Magnesium oxide fume - Total Particulate (CAS: 1309-48-4)

REL (Inhalation): See Appendix D (NIOSH)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 4. Silica, crystalline quartz, respirable dust (CAS: 14808-60-7)

PEL (Inhalation): See Annotated Z-3 ppm (OSHA)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 5. Silica, crystalline quartz, respirable dust (CAS: 14808-60-7)

PEL (Inhalation): See Annotated Z-3 mg/m<sup>3</sup> (OSHA)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 6. Silica, crystalline quartz, respirable dust (CAS: 14808-60-7)

PEL (Inhalation): See Annotated Z-3 (Cal/OSHA)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

#### 7. Silica, crystalline quartz, respirable dust (CAS: 14808-60-7)

REL (Inhalation): See Annotated Z-3 (NIOSH)

OSHA Annotated Table Z-1, [www.osha.gov](http://www.osha.gov)

### Appropriate engineering controls

Provide ventilation adequate to maintain PELs.

### Individual protection measures, such as personal protective equipment (PPE)

# Safety Data Sheet

## Hi-Yield Horticultural Hydrated Lime

### Eye/face protection

Use NIOSH/MSHA N95 approved respirators if airborne concentration exceeds PEL.

### Skin protection

Use appropriate gloves to prevent skin contact. Where there is a risk of skin contact, wear suitable clothing to prevent such contact.

---

## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

Appearance/form	Solid/ White or grayish - white
Odor	Odorless
Odor threshold	No data available.
pH	No data available.
Melting point/freezing point	Melting Point : 580 C
Initial boiling point and boiling range	No data available.
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.
Upper/lower flammability limits	No data available.
Upper/lower explosive limits	No data available.
Vapor pressure	No data available.
Vapor density	No data available.
Relative density	No data available.
Solubility(ies)	Slightly Soluble in Water
Partition coefficient: n-octanol/water	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Explosive properties	No data available.
Oxidizing properties	No data available.

### Other safety information

No data available.

---

## SECTION 10: Stability and reactivity

### Reactivity

Not generally reactive under normal conditions

### Chemical stability

Stable under normal conditions

### Possibility of hazardous reactions

Mixture with strong acids

### Conditions to avoid

None known

# Safety Data Sheet

## Hi-Yield Horticultural Hydrated Lime

### Incompatible materials

Strong Acids

### Hazardous decomposition products

Calcium Oxides

---

## SECTION 11: Toxicological information

### Information on toxicological effects

#### Additional information

Information on the likely routes of exposure:

Inhalation and ingestion

Symptoms related to the physical, chemical and toxicological characteristics:

Nausea, Coffee Ground Emesis, Diarrhea, and Dermatitis

---

## SECTION 12: Ecological information

### Toxicity

This material is not to be expected to be harmful to the ecology

### Persistence and degradability

Dissolved in water

### Bioaccumulative potential

This material shows no bioaccumulation effect or food chain concentration toxicity.

### Mobility in soil

No data available.

### Results of PBT and vPvB assessment

No data available.

### Other adverse effects

No data available.

---

## SECTION 13: Disposal considerations

### Disposal of the product

Dispose of in accordance with all applicable federal, state, and local environmental regulations. If this product as supplied, and unmixed, becomes a waste, it will not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act.

---

## SECTION 14: Transport information

### DOT (US)

UN Number: Not Regulated

Proper Shipping Name: Calcium Hydroxide

## Safety Data Sheet

### Hi-Yield Horticultural Hydrated Lime

Environmental hazards: This material is alkaline and if released into water or moist soil will cause an increase in pH

---

## SECTION 15: Regulatory information

### Safety, health and environmental regulations specific for the product in question

#### New Jersey Right To Know Components

Common name: MAGNESIUM OXIDE

CAS number: 1309-48-4

#### Pennsylvania Right To Know Components

Chemical name: Magnesium oxide

CAS number: 1309-48-4

#### New Jersey Right To Know Components

Common name: SILICA, QUARTZ

CAS number: 14808-60-7

#### Pennsylvania Right To Know Components

Chemical name: Quartz

CAS number: 14808-60-7

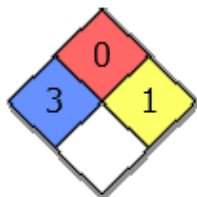
#### California Prop. 65 components

Chemical name: Silica, crystalline (airborne particles of respirable size)

CAS number: 14808-60-7

10/01/1988 - cancer

### NFPA Rating



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## SECTION 16: Other information

No data available.

## PRODUCT DATA SHEET

# Purolite® FerriX™ A33E

Polystyrenic Macroporous

## PRINCIPAL APPLICATIONS

- Arsenic Removal

## ADVANTAGES

- Infused with nano-sized particles of iron oxide
- Superior bead strength
- Low pressure drop
- Arsenic removal < 8 ppb
- No need for backwashing during typical operation

## REGULATORY APPROVALS

- Certified by the WQA to NSF/ANSI-61 Standard
- OSHA 29CFR 1910.1200 Certified
- Water Regulations Advisory Scheme Approved

## TYPICAL PACKAGING

- 1 ft³ Sack
- 25 L Sack
- 5 ft³ Drum (Fiber)
- 1 m³ Supersack
- 42 ft³ Supersack

*\* Once the resin is put into service, backwashing is not permitted as this will lead to shortened bed life.*

## TYPICAL PHYSICAL & CHEMICAL CHARACTERISTICS:

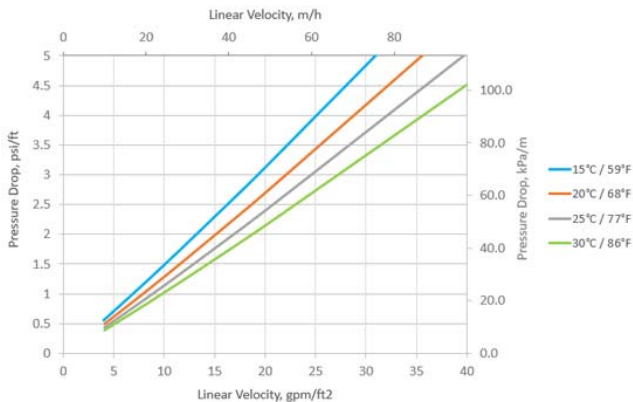
Polymer Structure	Polystyrene crosslinked with divinylbenzene
Appearance	Brown spherical beads
Particle Size Range	300 - 1200 µm
< 300 µm (max.)	1 %
Uniformity Coefficient (max.)	1.7
Shipping Weight (approx.)	720 - 760 g/L (45.0 - 47.5 lb/ft³)
Temperature Limit	80 °C (176.0 °F)
pH limits, Operating	4.5 - 8.5

# Hydraulic Characteristics

## PRESSURE DROP

The pressure drop across a bed of ion exchange resin depends on the particle size distribution, bed depth, and voids volume of the exchange material, as well as on the flow rate and viscosity of the influent solution. Factors affecting any of these parameters—such as the presence of particulate matter filtered out by the bed, abnormal compressibility of the resin, or the incomplete classification of the bed—will have an adverse effect, and result in an increased head loss. Depending on the quality of the influent water, the application and the design of the plant, service flow rates may vary from 10 to 40 BV/h.

## PRESSURE DROP ACROSS RESIN BED





Algeria  
Australia  
Bahrain  
Brazil  
Canada  
China  
Czech Republic  
France  
Germany

India  
Indonesia  
Israel  
Italy  
Japan  
Jordan  
Kazakhstan  
Korea  
Malaysia

Mexico  
Morocco  
New Zealand  
Poland  
Romania  
Russia  
Singapore  
Slovak Republic  
South Africa

Spain  
Taiwan  
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### SECTION 1: Identification

#### 1.1. Identification

Product form	: Mixture
Trade name	: FerroBlack® -FS27
CAS No	: 1317-37-9
Formula	: FeS
Synonyms	: Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide / Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: Chemical used for the removal and/or sequestering of mercury. Also used as a mercury re-emission prevention chemical in wet flue gas desulfurization units.
------------------------------	---

#### 1.3. Details of the supplier of the safety data sheet

Redox Technology Group, LLC  
d/b/a Redox Solutions  
1580 Research Way  
Indianapolis, IN 46231

Company Contact: Jim Kissel  
Telephone Number: (317) 660-6867 or (317) 412-3267

#### 1.4. Emergency telephone number

CHEMTREC: (800) 424-9300

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Skin corrosion/irritation Category 2	H315
Serious eye damage/eye irritation Category 2A	H319
Full text of H statements : see section 16	

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US)



GHS07

Signal word (GHS-US)	: Warning
Hazard statements (GHS-US)	: H315 - Causes skin irritation H319 - Causes serious eye irritation
Precautionary statements (GHS-US)	: P264 - Wash hands thoroughly after handling P280 - Wear eye protection, protective clothing, protective gloves P302+P352 - If on skin: Wash with plenty of water P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P321 - Specific treatment (see Consult a doctor/medical service if you feel unwell on this label) P332+P313 - If skin irritation occurs: Get medical advice/attention P337+P313 - If eye irritation persists: Get medical advice/attention P362+P364 - Take off contaminated clothing and wash it before reuse



# FerroBlack®-FS27

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 2.3. Other hazards

#### HMIS Classification:

Health hazard: 0  
Flammability: 0  
Physical hazards: 0

#### NFPA Rating:

Health hazard: 1  
Fire: 0  
Reactivity Hazard: 0

**Inhalation** May be harmful if inhaled. May cause respiratory tract irritation.

**Skin** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

**Ingestion** May be harmful if swallowed.

**Other Hazards not contributing to the classification:** Generates toxic gas in contact with acid.

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	GHS-US classification
Iron sulfide (FeS)	(CAS No) 1317-37-9	7 -11	Not classified
Sodium Sulfide	(CAS No) 1313-82-2	0.1 - 1	Acute Tox. 3 (Oral), H301

Full text of hazard classes and H-statements : see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general	: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
First-aid measures after skin contact	: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor/physician. Call a poison center/doctor/physician if you feel unwell.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	: Causes skin and eye irritation.
Symptoms/injuries after skin contact	: Irritation.
Symptoms/injuries after eye contact	: Causes serious eye damage. Eye irritation.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	: Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media	: Do not use a heavy water stream.

### 5.2. Special hazards arising from the substance or mixture

Reactivity	: Corrosive vapors.
------------	---------------------

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### 5.3. Advice for firefighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

- Emergency procedures : Ventilate spillage area. Evacuate unnecessary personnel. Avoid contact with skin and eyes.

#### 6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Ventilate area.

### 6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

- Methods for cleaning up : Take up liquid spill into absorbent material. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.
- Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe dust, fume, gas, mist, spray, vapors. Avoid contact during pregnancy/while nursing. Avoid contact with skin and eyes. Wear personal protective equipment.
- Hygiene measures : Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

### 7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Comply with applicable regulations.
- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Ignition sources, Incompatible materials. Keep container closed when not in use. Store in a well-ventilated place. Keep cool.
- Incompatible products : Strong bases. Strong acids.
- Incompatible materials : Sources of ignition. Direct sunlight.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

FerroBlack-FS27 (1317-37-9)		
ACGIH	ACGIH TWA (mg/m³)	1.4 mg/m³
ACGIH	ACGIH TWA (ppm)	1 ppm
ACGIH	ACGIH STEL (mg/m³)	7 mg/m³
ACGIH	ACGIH STEL (ppm)	5 ppm
Iron sulfide (FeS) (1317-37-9)		
Not applicable		
Sodium sulfide (1313-82-2)		
Not applicable		

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### 8.2. Exposure controls

Appropriate engineering controls	: Ensure good ventilation of the work station.
Personal protective equipment	: Avoid all unnecessary exposure.
Hand protection	: Wear protective gloves.
Eye protection	: Chemical goggles or face shield. Safety glasses.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: Wear appropriate mask.
Environmental exposure controls	: Avoid release to the environment.
Other information	: Do not eat, drink or smoke during use.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Black liquid with visible suspended solids.
Color	: Black
Odor	: Rotten eggs
Odor threshold	: No data available
pH	: 11.5 - 12.8
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: Non flammable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: 1.15 - 1.22
Solubility	: Minimally soluble in water.
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Acidic vapors.

### 10.2. Chemical stability

Not established.

### 10.3. Possibility of hazardous reactions

Contact with acids liberates toxic gas.

### 10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

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### 10.5. Incompatible materials

Acids will cause the release of highly toxic Hydrogen Sulfide. Reacts violently with diazonium salts. Ferrous sulfide(s) solution is not compatible with copper, zinc, aluminum or their **alloys** (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150° F (65.5° C). These materials of construction should not be used in handling systems or storage containers for this product.

### 10.6. Hazardous decomposition products

Hazardous decomposition products formed under fire may include sulfur oxides, iron oxides.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Sodium Sulfide (113-82-2)	
LD50 oral rat	208 mg/kg
ATE US (oral)	208.000 mg/kg body weight
LD50 dermal rabbit	< 340 mg/kg
ATE US (dermal)	300.000 mg/kg body weight

Skin corrosion/irritation : Causes skin irritation.  
pH: 11.5 - 12.8

Serious eye damage/irritation : Causes eye irritation.  
pH: 11.5 - 12.8

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after skin contact : Irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

FerroBlack-FS27 (1317-37-9)	
LC50 fish 1	> 10000 mg/l Mosquito fish

Sodium Sulfide (1313-82-2)	
LC50 fish 1	7.7 - 29.1 mg/l (Exposure time: 96 h - Species: Poecilia reticulata)
EC50 Daphnia 1	2.1 mg/l (Exposure time: 48 h - Species: Daphnia magna)

### 12.2. Persistence and degradability

FerroBlack-FS27 (1317-37-9)	
Persistence and degradability	Not established.

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### 12.3. Bioaccumulative potential

#### FerroBlack-FS27 (1317-37-9)

Bioaccumulative potential	Not established.
---------------------------	------------------

#### Sodium Sulfide (16721-80-5)

Log Pow	-3.5 (at 25 °C)
---------	-----------------

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Effect on the global warming : No known effects from this product.

GWPmix comment : No known effects from this product.

Other information : Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Waste disposal recommendations : Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Ecology - waste materials : Avoid release to the environment.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Not Regulated

### Transport by sea

Not Regulated

### Air transport

Not Regulated

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
---

#### Sodium Sulfide (1313-82-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
---

### 15.2. International regulations

#### CANADA

#### Iron sulfide (FeS) (1317-37-9)

Listed on the Canadian DSL (Domestic Substances List)
---

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
----------------------	---

#### Sodium Sulfide (1313-82-2)

Listed on the Canadian DSL (Domestic Substances List)
---

### EU-Regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
--

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### Sodium Sulfide (1313-82-2)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### National regulations

#### Iron sulfide (FeS) (1317-37-9)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

#### Sodium Sulfide (1313-82-2)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on INSQ (Mexican National Inventory of Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)

### 15.3. US State regulations

#### Sodium Sulfide (1313-82-2)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List

## SECTION 16: Other information

Revision date : 06/14/2016

Other information : None.

Full text of H-phrases:

H301	Toxic if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H400	Very toxic to aquatic life

SDS US (GHS HazCom 2012)

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

## SAFETY DATA SHEET

Version 6.9  
Revision Date 10/19/2022  
Print Date 12/31/2022

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Sodium hydroxide

Product Number : 221465  
Brand : SIGALD  
Index-No. : 011-002-00-6  
CAS-No. : 1310-73-2

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Synthesis of substances

**1.3 Details of the supplier of the safety data sheet**

Company : Sigma-Aldrich Inc.  
3050 SPRUCE ST  
ST. LOUIS MO 63103  
UNITED STATES

Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

**1.4 Emergency telephone**

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-  
527-3887 CHEMTREC (International) 24  
Hours/day; 7 Days/week

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Corrosive to Metals (Category 1), H290  
Skin corrosion (Category 1A), H314  
Serious eye damage (Category 1), H318  
Short-term (acute) aquatic hazard (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 GHS Label elements, including precautionary statements**

Pictogram



Signal Word

Danger

Hazard statement(s)	
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.
Precautionary statement(s)	
P234	Keep only in original container.
P260	Do not breathe dust.
P264	Wash skin thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P405	Store locked up.
P406	Store in corrosive resistant container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Synonyms	: 'Caustic soda'
Formula	: HNaO
Molecular weight	: 40.00 g/mol
CAS-No.	: 1310-73-2
EC-No.	: 215-185-5
Index-No.	: 011-002-00-6

Component	Classification	Concentration
<b>sodium hydroxide</b>		
	Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; Aquatic Acute 3; H290, H314, H318, H402 Concentration limits: >= 0.4 %: Met. Corr. 1, H290; >= 5 %: Skin Corr. 1A, H314; 2 - < 5 %: Skin Corr. 1B, H314; 0.5 - < 2 %: Skin Irrit. 2, H315; 0.5 - < 2 %: Eye Irrit. 2,	<= 100 %



	H319;	
--	-------	--

For the full text of the H-Statements mentioned in this Section, see Section 16.

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## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Call in physician.

#### In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

#### In case of eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

#### If swallowed

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

---

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

#### Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

#### Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

### 5.2 Special hazards arising from the substance or mixture

Sodium oxides

Sodium oxides

Not combustible.

Ambient fire may liberate hazardous vapours.

### 5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

#### **5.4 Further information**

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

### **SECTION 6: Accidental release measures**

#### **6.1 Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

#### **6.2 Environmental precautions**

Do not let product enter drains.

#### **6.3 Methods and materials for containment and cleaning up**

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

#### **6.4 Reference to other sections**

For disposal see section 13.

---

### **SECTION 7: Handling and storage**

#### **7.1 Precautions for safe handling**

For precautions see section 2.2.

#### **7.2 Conditions for safe storage, including any incompatibilities**

##### **Storage conditions**

No metal containers.

Tightly closed. Dry.

##### **Storage class**

Storage class (TRGS 510): 8B: Non-combustible, corrosive hazardous materials

#### **7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

---

### **SECTION 8: Exposure controls/personal protection**

#### **8.1 Control parameters**

##### **Ingredients with workplace control parameters**

Component	CAS-No.	Value	Control parameters	Basis
sodium hydroxide	1310-73-2	C	2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		C	2 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		C	2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

#### Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Long-term local effects	1 mg/m3
Consumers	Inhalation	Long-term local effects	1 mg/m3

## 8.2 Exposure controls

### Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

### Personal protective equipment

#### Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

#### Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:KCL 741 Dermatrill® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:KCL 741 Dermatrill® L

#### Body Protection

protective clothing

### **Respiratory protection**

required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

### **Control of environmental exposure**

Do not let product enter drains.

---

## **SECTION 9: Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

a) Appearance	Form: pellets Color: white
b) Odor	odorless
c) Odor Threshold	Not applicable
d) pH	ca. > 14 at 100 g/l at 20 °C (68 °F)
e) Melting point/freezing point	Melting point/range: 318 °C (604 °F) - lit.
f) Initial boiling point and boiling range	1,390 °C 2,534 °F at 1,013 hPa
g) Flash point	( )Not applicable
h) Evaporation rate	No data available
i) Flammability (solid, gas)	The product is not flammable.
j) Upper/lower flammability or explosive limits	No data available
k) Vapor pressure	No data available
l) Vapor density	1.38 - (Air = 1.0)
m) Density	2.13 g/cm <sup>3</sup> at 20 °C (68 °F)
Relative density	No data available
n) Water solubility	1,090 g/l at 20 °C (68 °F)
o) Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p) Autoignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

### **9.2 Other safety information**

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Relative vapor density 1.38 - (Air = 1.0)

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

### 10.3 Possibility of hazardous reactions

Violent reactions possible with:

Acetone

Chlorine

Ethylene oxide

Fluorine

Hydrogen halides

Hydrazine hydrate

hydroxylamine

Acid anhydrides

Acrolein

Acid chlorides

Acids

sulfuric acid

Chloroform

Water

hydrogen peroxide

anhydrides

phosphides

halogen-halogen compounds

trichloroethene

can decompose violently in contact with:

Organic Substances

hydrogen sulphide

Risk of ignition or formation of inflammable gases or vapours with:

powdered aluminium

Ammonium salts

persulfates

Sodium borohydride

phosphorus

Oxides of phosphorus

Halogenated hydrocarbon

Light metals

Metals

Risk of explosion/exothermic reaction with:

Bromine

Calcium

in powder form

furfuryl alcohol

Nitromethane

Peroxides

organic nitro compounds

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Nitriles  
Acrylic monomers  
Chloroform  
with  
Acetone  
Nitrobenzene  
with  
Methanol  
Nitrobenzene  
with  
salts  
magnesium  
Zinc  
and  
Tin  
(in the presence of atmospheric oxygen and/or moisture)

#### **10.4 Conditions to avoid**

no information available

#### **10.5 Incompatible materials**

Aluminum, brass, Metals, metal alloys, Zinc, Tin

#### **10.6 Hazardous decomposition products**

In the event of fire: see section 5

---

### **SECTION 11: Toxicological information**

#### **11.1 Information on toxicological effects**

##### **Acute toxicity**

Oral: No data available

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Inhalation: No data available

Inhalation: Corrosive to respiratory system.

Symptoms: burns of mucous membranes, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Dermal: No data available

No data available

##### **Skin corrosion/irritation**

Skin - Rabbit

Result: Causes burns.

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

##### **Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Causes serious eye damage.

(OECD Test Guideline 405)

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

Remarks: Causes serious eye damage.

##### **Respiratory or skin sensitization**

Patch test: - In vitro study

Result: negative  
Remarks: (ECHA)

#### **Germ cell mutagenicity**

No data available

#### **Carcinogenicity**

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

#### **Reproductive toxicity**

No data available

#### **Specific target organ toxicity - single exposure**

No data available

#### **Specific target organ toxicity - repeated exposure**

No data available

#### **Aspiration hazard**

No data available

### **11.2 Additional Information**

RTECS: WB4900000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

---

## **SECTION 12: Ecological information**

### **12.1 Toxicity**

Toxicity to fish	LC50 - Gambusia affinis (Mosquito fish) - 125 mg/l - 96 h Remarks: (ECOTOX Database)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Ceriodaphnia (water flea) - 40.4 mg/l - 48 h Remarks: (ECHA)
Toxicity to bacteria	EC50 - Photobacterium phosphoreum - 22 mg/l - 15 min Remarks: (External MSDS)

## 12.2 Persistence and degradability

The methods for determining the biological degradability are not applicable to inorganic substances.

## 12.3 Bioaccumulative potential

No data available

## 12.4 Mobility in soil

No data available

## 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

## 12.6 Endocrine disrupting properties

No data available

## 12.7 Other adverse effects

Harmful effect due to pH shift.

Forms corrosive mixtures with water even if diluted.

Neutralisation possible in waste water treatment plants.

Discharge into the environment must be avoided.

---

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

---

## SECTION 14: Transport information

### DOT (US)

UN number: 1823    Class: 8    Packing group: II

Proper shipping name: Sodium hydroxide, solid

Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

### IMDG

UN number: 1823    Class: 8    Packing group: II

EMS-No: F-A, S-B

Proper shipping name: SODIUM HYDROXIDE, SOLID

### IATA

UN number: 1823    Class: 8    Packing group: II

Proper shipping name: Sodium hydroxide, solid

---

## SECTION 15: Regulatory information

### SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

### SARA 313 Components

SIGALD - 221465

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This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**

No SARA Hazards

**Massachusetts Right To Know Components**

No components are subject to the Massachusetts Right to Know Act.

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**SECTION 16: Other information****Further information**

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See [www.sigma-aldrich.com](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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**Appendix F**

**Titration Record**

**Appendix F**  
**Titration Record**  
**AOI 7, MHIC**

MW-608D Soil/MW-606S Groundwater									
Calcium Polysulfide Titration						Calcium Hydroxide Titration			
Low Soil Content			High Soil Content			Low Soil Content		High Soil Content	
CaSx (mL)	pH (S.U.)	ORP (mV)	CaSx (mL)	pH (S.U.)	ORP (mV)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)
0	6.5	299	0	6.6	198	0	6.5	0	6.7
0.05	6.8	238	0.1	7.6	-171	0.05	10.0	0.05	7.9
0.15	7.8	-336				0.075	10.0	0.075	10.4
						0.125	11.1	0.125	11.7
						0.175	12.2	0.15	11.8
								0.175	12.0

MW-608D Soil/MW-608D Groundwater									
Calcium Polysulfide Titration						Calcium Hydroxide Titration			
Low Soil Content			High Soil Content			Low Soil Content		High Soil Content	
CaSx (mL)	pH (S.U.)	ORP (mV)	CaSx (mL)	pH (S.U.)	ORP (mV)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)
0	7.0	234	0	7.0	170	0	6.9	0	7.0
0.05	7.2	192	0.1	7.4	-76	0.05	7.9	0.10	8.8
0.125	7.3	40	0.2	7.7	-163	0.10	10.3	0.20	8.9
0.175	7.5	-33	0.3	8.0	-218	0.20	10.7	0.40	12.0
0.20	7.5	-69				0.30	12.3		
0.25	7.5	-89							
0.35	7.5	-140							
0.45	7.4	-175							

**Appendix F**  
**Titration Record**  
**AOI 7, MHIC**

MW-560D Soil/MW-560D Groundwater									
Calcium Polysulfide Titration						Calcium Hydroxide Titration			
Low Soil Content			High Soil Content			Low Soil Content		High Soil Content	
CaSx (mL)	pH (S.U.)	ORP (mV)	CaSx (mL)	pH (S.U.)	ORP (mV)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)
0	6.5	279	0	6.6	170	0	6.5	0	6.7
0.05	6.9	-177	0.025	6.9	-33	0.05	10.5	0.10	9.3
0.1	7.5	-288	0.05	6.9	-16	0.10	11.8	0.15	11.4
			0.10	7.3	-126	0.15	12.0	0.20	12.0
			0.15	7.6	-172				
			0.20	7.9	-203				

MW-609D Soil/MW-609D Groundwater															
Calcium Polysulfide Titration						Calcium Hydroxide Titration				Ferroblack Titration					
Low Soil Content			High Soil Content			Low Soil Content		High Soil Content		Low Soil Content			High Soil Content		
CaSx (mL)	pH (S.U.)	ORP (mV)	CaSx (mL)	pH (S.U.)	ORP (mV)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)	Ca(OH) <sub>2</sub> (g)	pH (S.U.)	FB (mg)	pH (S.U.)	ORP (mV)	FB (mg)	pH (S.U.)	ORP (mV)
0	6.8	-110	0	6.8	60	0	6.9	0	7.0	0	6.8	-142	0	6.9	-68
0.05	6.9	-152	0.05	7.0	-103	0.1	9.7	0.05	8.2	38	6.8	-120	60	6.9	-72
0.1	7.1	-172	0.1	7.3	-128	0.15	10.8	0.10	10.3	71	6.8	-87	150	7.0	-68
0.2	7.4	-210	0.15	7.4	-162	0.20	11.9	0.15	11.9	137	6.9	-58	260	7.0	-4
0.30	7.4	-220	0.25	7.8	-237	0.25	12.2	0.2	12.9	215	7.0	-31	380	7.1	-59
0.4	7.4	-216								282	7.0	-32	500	7.1	2
0.5	7.3	-245								392	7.1	-31	500	7	
										392	7.2	-22	1140	7.1	
										603	7.3	-78	1640	7.1	
										1049	7.5	-104	2210	7.3	
										1545	7.6	-147			
										2286	7.8	-135			

# Appendix F

## Titration Record

### AOI 7, MHIC

AOI7-BH-22-001 Soil/MW-56D Groundwater															
Calcium Polysulfide Titration						Calcium Hydroxide Titration				Ferroblack Titration					
Low Soil Content			High Soil Content			Low Soil Content		High Soil Content		Low Soil Content			High Soil Content		
CaSx	pH	ORP	CaSx	pH	ORP	Ca(OH) <sub>2</sub>	pH	Ca(OH) <sub>2</sub>	pH	FB	pH	ORP	FB	pH	ORP
mL	S.U.	mV	mL	S.U.	mV	g	S.U.	g	S.U.	mg	S.U.	mV	mg	S.U.	mV
0	6.6	-62	0	6.6	-87	0	6.7	0	6.9	0	6.7	-82	0	6.7	-93
0.1	7.0	-153	0.05	6.9	-43	0.05	8.6	0.10	10.5	141	6.7	-98	90	6.7	-96
0.15	7.2	-190	0.1	7.1	-169	0.10	9.8	0.20	9.8	230	6.8	-107	220	6.7	-101
0.2	7.5	-220	0.15	7.2	-174	0.15	8.4	0.30	9.8	331	6.9	-40	350	6.7	-101
			0.25	7.6	-218	0.20	9.7	0.4	12.1	457	6.8	-109	560	6.9	-107
						0.30	10.1						720	6.7	-108
						0.40	12.0								

#### Abbreviations:

mL - milliliter

CaSx - Calcium polysulfide

Ca(OH)<sub>2</sub> - Calcium hydroxide

FB - Ferroblack

S.U. - Standard Unit

ORP - Oxidation-reduction Potential

mg - Milligrams

mV - millivolts

#### Notes:

1. Titration tests were conducted to determine the Ca(OH)<sub>2</sub>, CaSx, and FB dosages. Two types of slurries consisting of a low soil content with soil:water ratio at 1:3 and a high soil content with soil:water ratio at 1:1 were set up for each of the five sample pairs (named for the groundwater sample) for each of the titration tests.

Low soil content consists of 45 grams of groundwater and 15 grams of soil

High soil content consists of 40 grams of groundwater and 40 grams of soil

2. An alkaline titration test was completed by titrating the low soil and high soil content slurries from each of the five sample pairs with Ca(OH)<sub>2</sub> powder to determine the Ca(OH)<sub>2</sub> reagent dosages required to increase the groundwater and soil slurry pH values to 8, 10, and 12 S.U.

3. The CaSx solutions were added to the low soil (1:3 soil:groundwater ratio) and high soil content (1:1 soil:groundwater ratio) slurries from each of the five sample pairs until the soil and groundwater slurry ORP levels decreased to below – 200 mV.

4. The FB solution was added to low soil (1:3 soil:groundwater ratio) and high soil content (1:1 soil:groundwater ratio) slurries for the MW-56D and MW-609D sample pairs (with high dissolved arsenic concentrations) until the soil and groundwater slurry ORP levels decreased to below – 100 mV. These titrations were used for the remaining sample pairs that had lower dissolved arsenic concentrations in groundwater.

## **Appendix G**

### **Dosage Calculations**

**Appendix G**  
**Reagent Dosage Estimate - Ion-Exchange Resin**  
**AOI 7, MHIC**

Low Soil Content (Soil:GW = 1:3)											
Location ID	Interval (ft bgs)	Arsenic (mg/L)	Volume of Water (L)	Mass of Arsenic (mg)	Resin Capacity (mg/L)	Resin Capacity (mg/kg)	Resin Volume (mL)	Resin Density (g/mL)	1X Resin Mass (g)	2X Resin Mass (g)	3X Resin Mass (g)
MW-560D	15 - 25	14.6	0.045	0.657	8,000	10,127	0.08	0.79	0.06	0.13	0.19
MW-608D	14 - 28	35	0.045	1.575	8,000	10,127	0.20	0.79	0.16	0.31	0.47
MW-608D	28 - 36	680	0.045	30.6	8,000	10,127	3.83	0.79	3.02	6.04	9.07
MW-609D	23 - 33	564	0.045	25.38	8,000	10,127	3.17	0.79	2.51	5.01	7.52
AOI7-BH-22-001	15 - 25	258	0.045	11.61	8,000	10,127	1.45	0.79	1.15	2.29	3.44
High Soil Content (Soil:GW = 1:1)											
Location ID	Interval (ft bgs)	Arsenic (mg/L)	Volume of Water (L)	Mass of Arsenic (mg)	Resin Capacity (mg/L)	Resin Capacity (mg/kg)	Resin Volume (mL)	Resin Density (g/mL)	1X Resin Mass (g)	2X Resin Mass (g)	3X Resin Mass (g)
MW-560D	15 - 25	14.6	0.03	0.438	8,000	10,127	0.05	0.79	0.04	0.09	0.13
MW-608D	14 - 28	35	0.03	1.05	8,000	10,127	0.13	0.79	0.10	0.21	0.31
MW-608D	28 - 36	680	0.03	20.4	8,000	10,127	2.55	0.79	2.01	4.03	6.04
MW-609D	23 - 33	564	0.03	16.92	8,000	10,127	2.12	0.79	1.67	3.34	5.01
AOI7-BH-22-001	15 - 25	258	0.03	7.74	8,000	10,127	0.97	0.79	0.76	1.53	2.29

**Abbreviations:**

ft bgs - Feet below ground surface

mg/g - Milligrams per kilogram

g - Grams

mg/L - Milligrams per liter

mL - Milliliter

GW - groundwater

L - Liter

g/mL - grams per milliliter

**Notes:**

1: The Ion-exchange (IX) resin, HIX-NanoFe from Purolite, has a known sorption capacity of arsenic at 8,000 mg of arsenic per liter of resin or 10,127 mg of arsenic per kilogram of resin. Therefore, the resin stoichiometric demand was estimated using the sorption capacity and the arsenic concentrations collected during the May 24, 2022 to May 26, 2022 groundwater sampling event for each sample.

Stoichiometric demand (g/L) = C (arsenic concentration) /Sorption Capacity

Stoichiometric demand (g) = C (arsenic concentration) \* Water Volume/Sorption Capacity

2: The dosage of IX was based on the stoichiometric demand of dissolved arsenic sorption. The bench scale treatability study dosages were calculated at one time (1X), two times (2X), and three times (3X) the stoichiometric demand.

**Appendix G**  
**Reagent Dosage Estimate - Calcium Polysulfide**  
**AOI 7, MHIC**

**Groundwater Screening Data for Calcium Polysulfide Dosage Estimates**

Parameter	Units	MW-608D	MW-609D	MW-56D
		6/3/2022	6/3/2022	6/3/2022
Dissolved Arsenic	mg/L	680	564	258
Dissolved Iron	mg/L	64.4	83	55.6
Dissolved Manganese	mg/L	1.98	1.32	1.22
Sulfide Demand for As	mmole/L	13.60	11.28	5.16
Sulfide Demand for Fe	mmole/L	1.15	1.48	0.99
Sulfide Demand for Mn	mmole/L	0.04	0.02	0.02
Sulfide Demand	mmole/L	14.79	12.79	6.18
29% CaS <sub>5</sub>	g/L	6.4243	5.5554	2.6829

**Calcium Polysulfide Dosage Estimates (grams)**

Sample Type	Reactor Water Volume (mL)	Stoichiometric Demand	MW-608D soil/ MW-608D groundwater	MW-609D soil/ MW-609D groundwater	AOI7-BH-22-001 soil/ MW-56D groundwater
Low Soil Content	50	1X	0.48	0.42	0.20
High Soil Content	40	1X	0.59	0.51	0.25
Low Soil Content	50	2X	0.96	0.96	0.40
High Soil Content	40	2X	1.18	1.02	0.49
Low Soil Content	50	3X	1.45	1.25	0.60
High Soil Content	40	3X	1.77	1.53	0.74

**Abbreviations:**

ft bgs - Feet below ground surface

mg/g - Milligrams per gram

g - Grams

SD - Stoichiometric demand

mg/L - Milligrams per liter

mL - Milliliter

mol - molar

As - arsenic

L - Liter

g/mL - grams per milliliter

CaS<sub>x</sub> - Calcium polysulfide

Mn - manganese

Fe - iron

**Notes:**

1: CaS<sub>x</sub> stoichiometric demands were estimated using dissolved arsenic, dissolved iron, and dissolved manganese concentrations from the May 24, 2022 to May 26, 2022 groundwater sampling event for each well. Sulfide can react with iron and manganese at 1(sulfide):1(iron/manganese) ratio and with arsenic at 3(sulfide):2 (arsenic) ratio to form metal precipitations. Therefore, the stoichiometric demand estimation was calculated using the formulation shown below.

Stoichiometric demand of sulfide (mole/L) = (C (arsenic molar concentration) + C(iron molar concentration) + 3/2\*C(arsenic molar concentration)).

Stoichiometric demand of CaS<sub>x</sub> (g/L) = Stoichiometric demand sulfide / [29% (CaS<sub>x</sub> solution concentration)\*60% (active sulfide in CaS<sub>x</sub>)\* CaS<sub>x</sub> molecular weight].

2: The dosage of CaS<sub>x</sub> was based on the stoichiometric demand of metal precipitation. The bench scale treatability study dosages were calculated at one time (1X), two times (2X), and three times (3X) the stoichiometric demand (SD).

Low Soil Content: 1X = 1.5 SD, 2X= 3.0 SD, 3X = 4.5 SD

High Soil Content: 1X = 2.3 SD, 2X= 4.6 SD, 3X = 7 SD

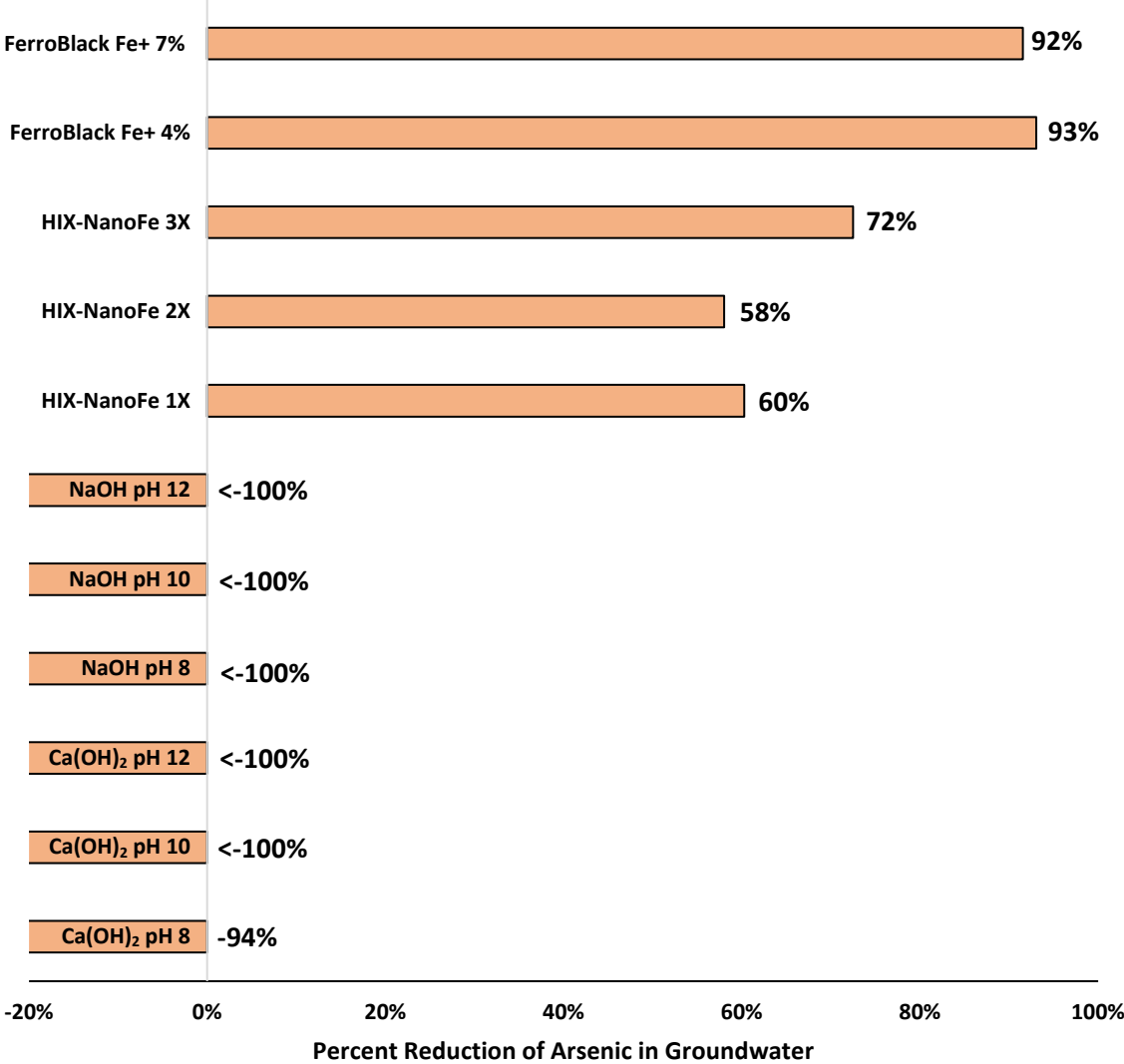


## **Appendix H**

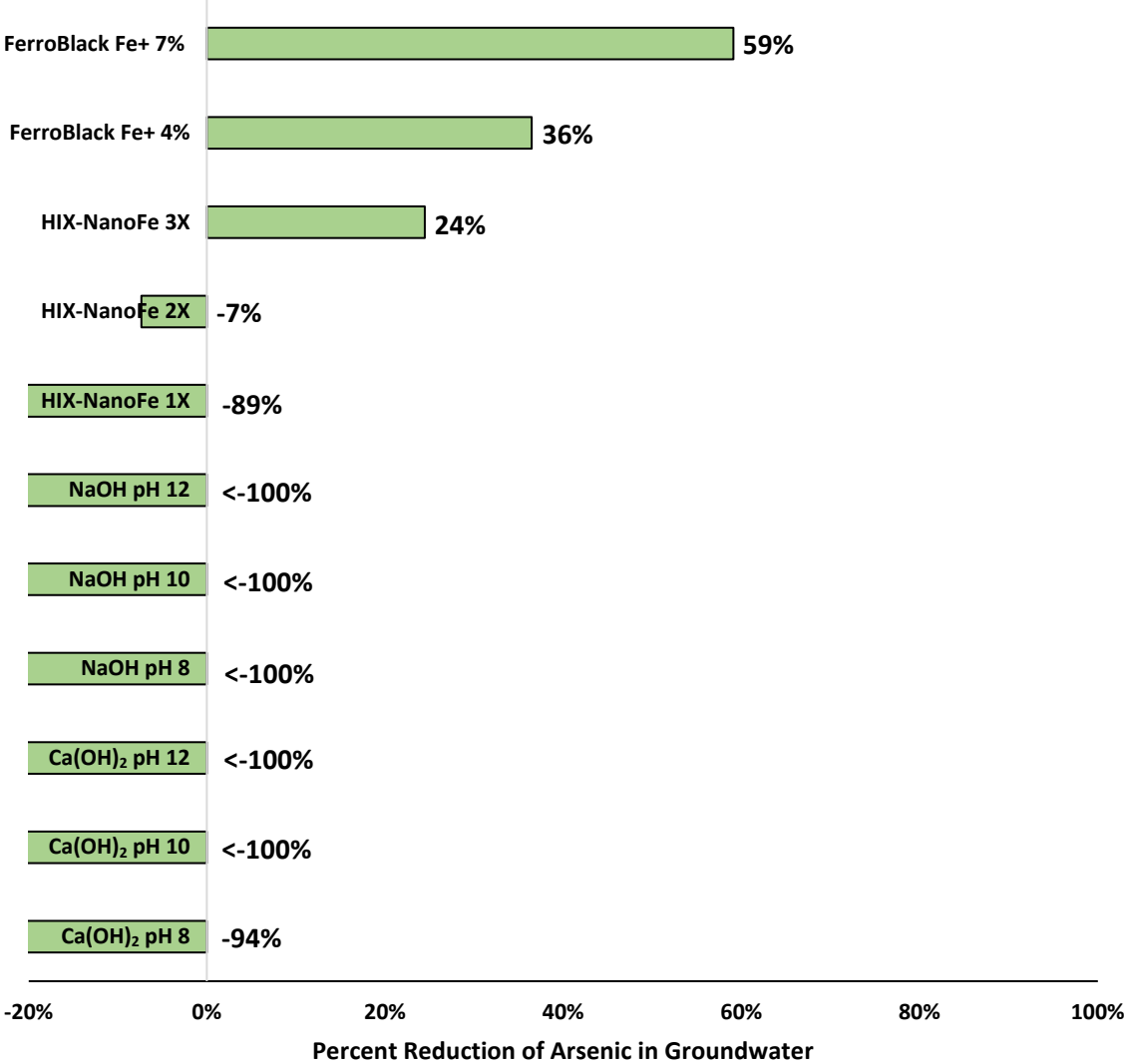
### **Arsenic Reduction Graphs from the Reagent Screening Test**

# MW-560D Soil and MW-560D Groundwater

Arsenic Reduction During Reagent Screening Test  
15g Soil Sample

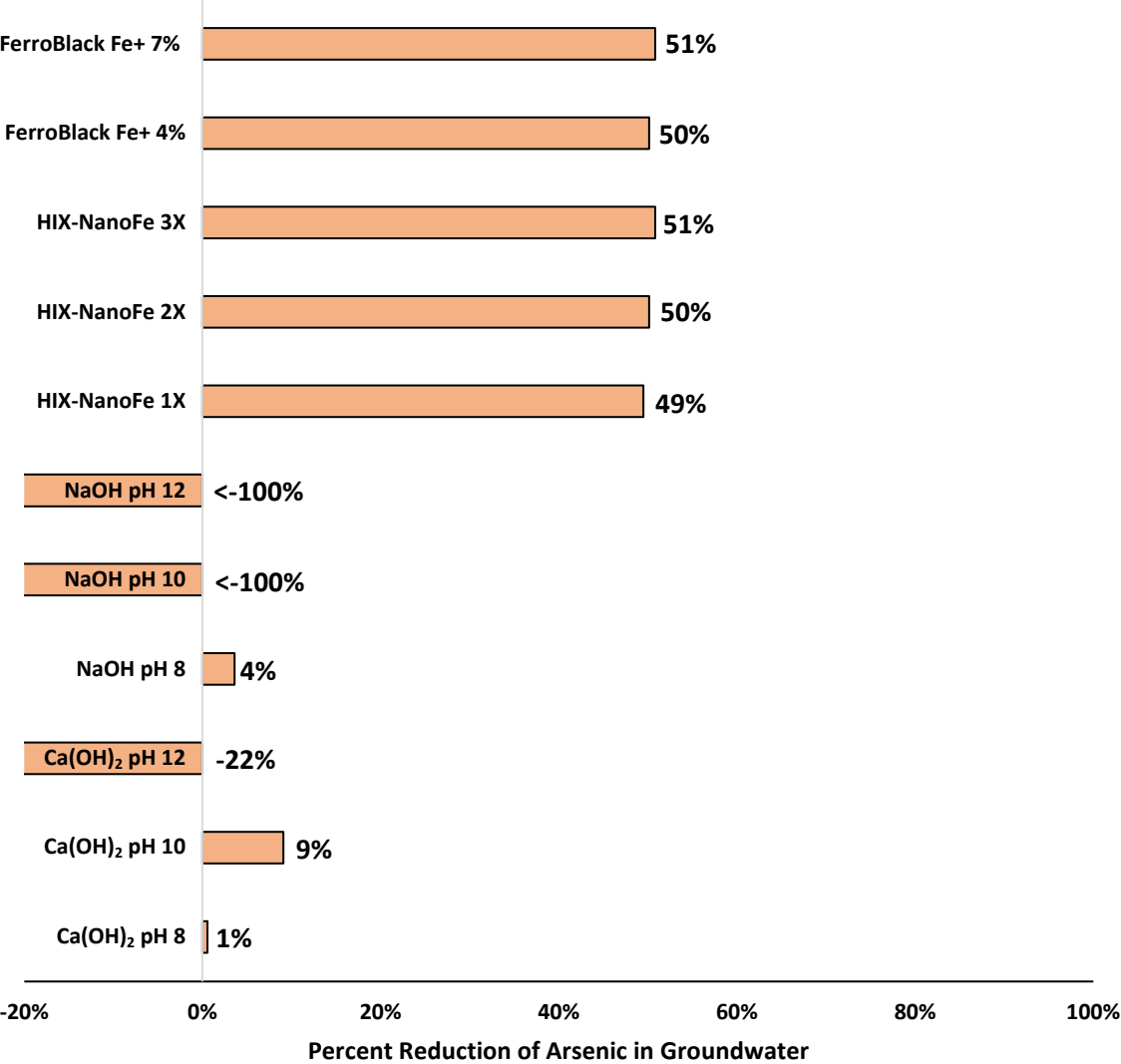


Arsenic Reduction During Reagent Screening Test  
40g Soil Sample

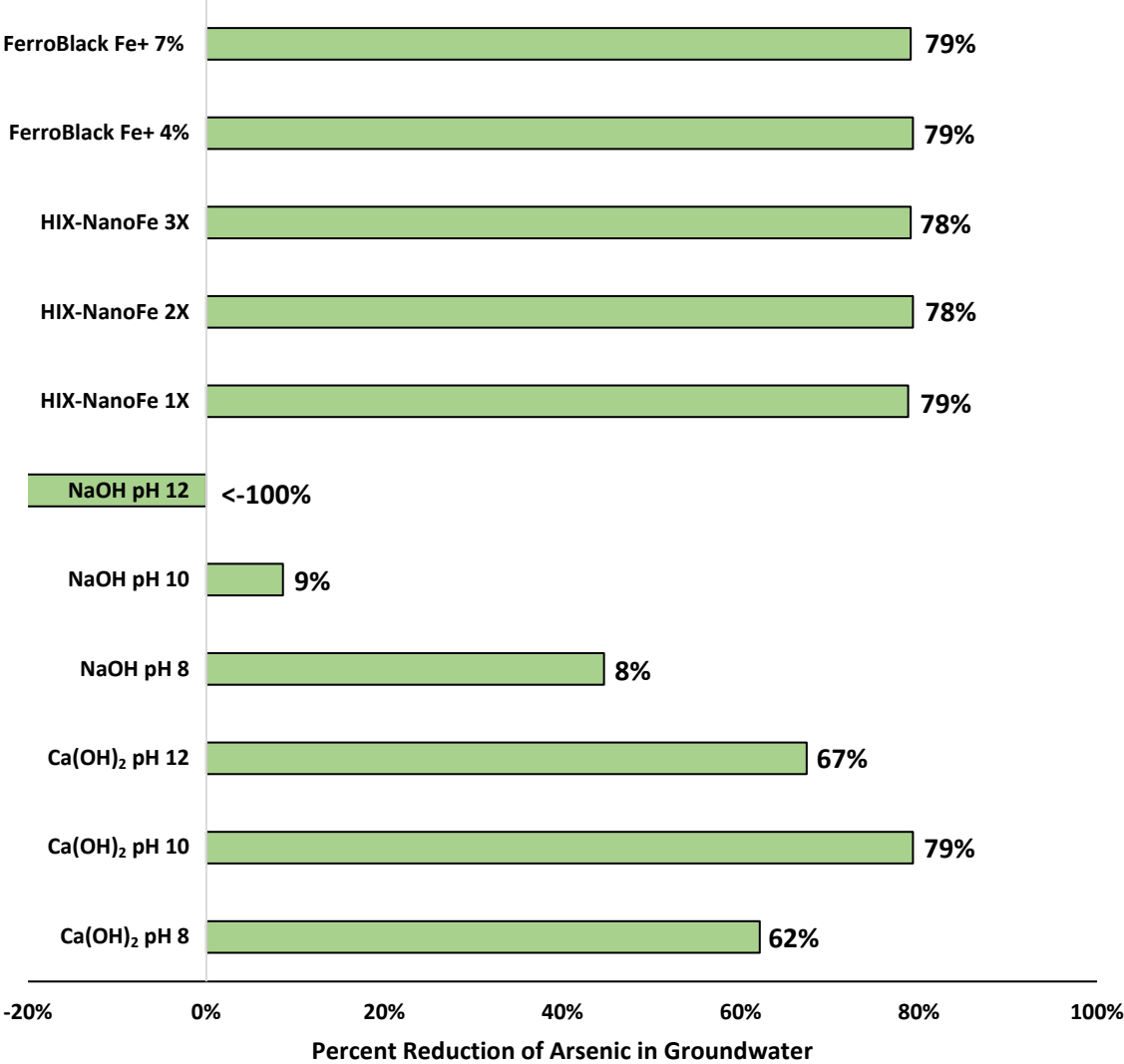


# MW-608D Soil and MW-606S Groundwater

## Arsenic Reduction During Reagent Screening Test 15g Soil Sample

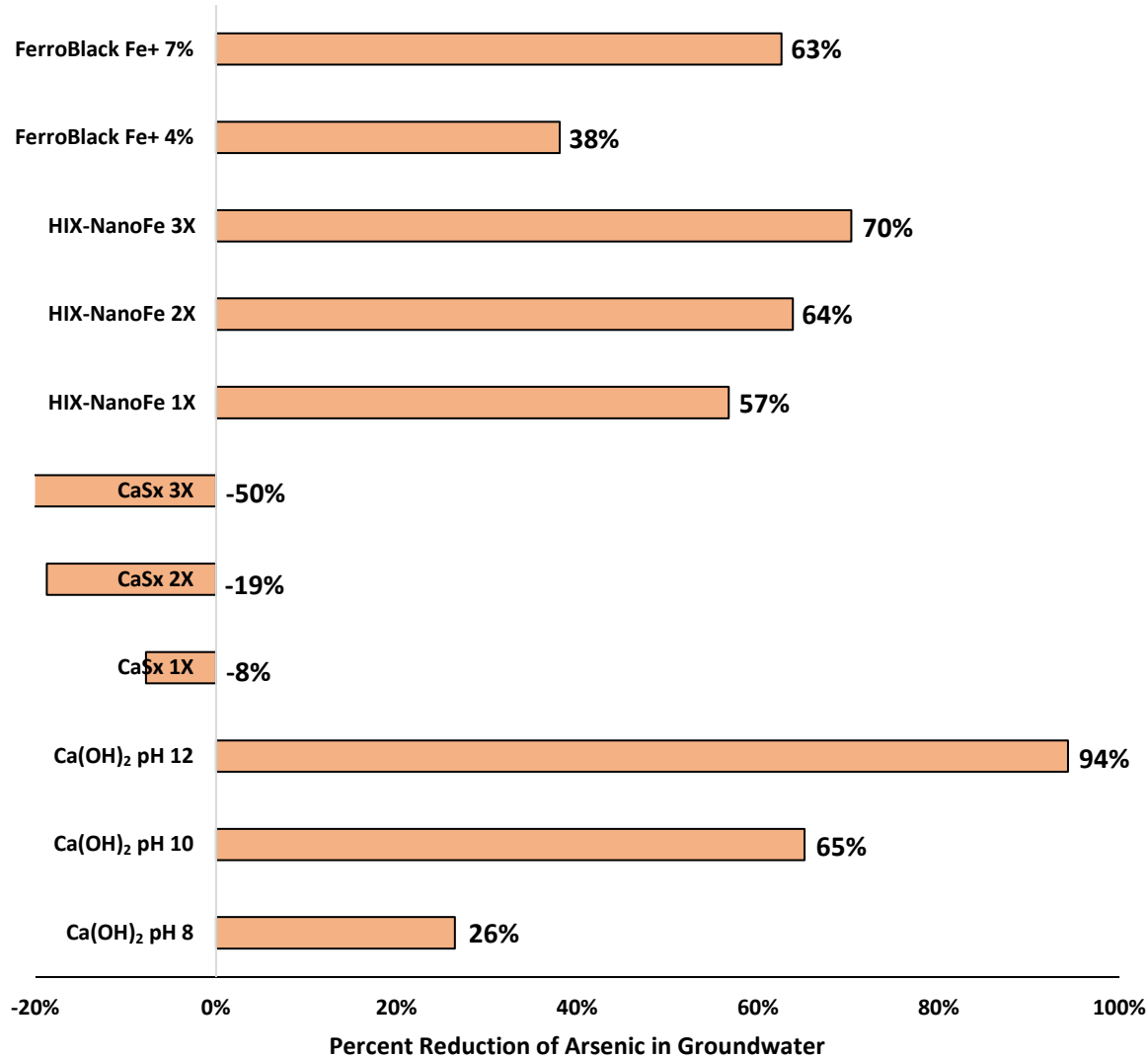


## Arsenic Reduction During Reagent Screening Test 40g Soil Sample

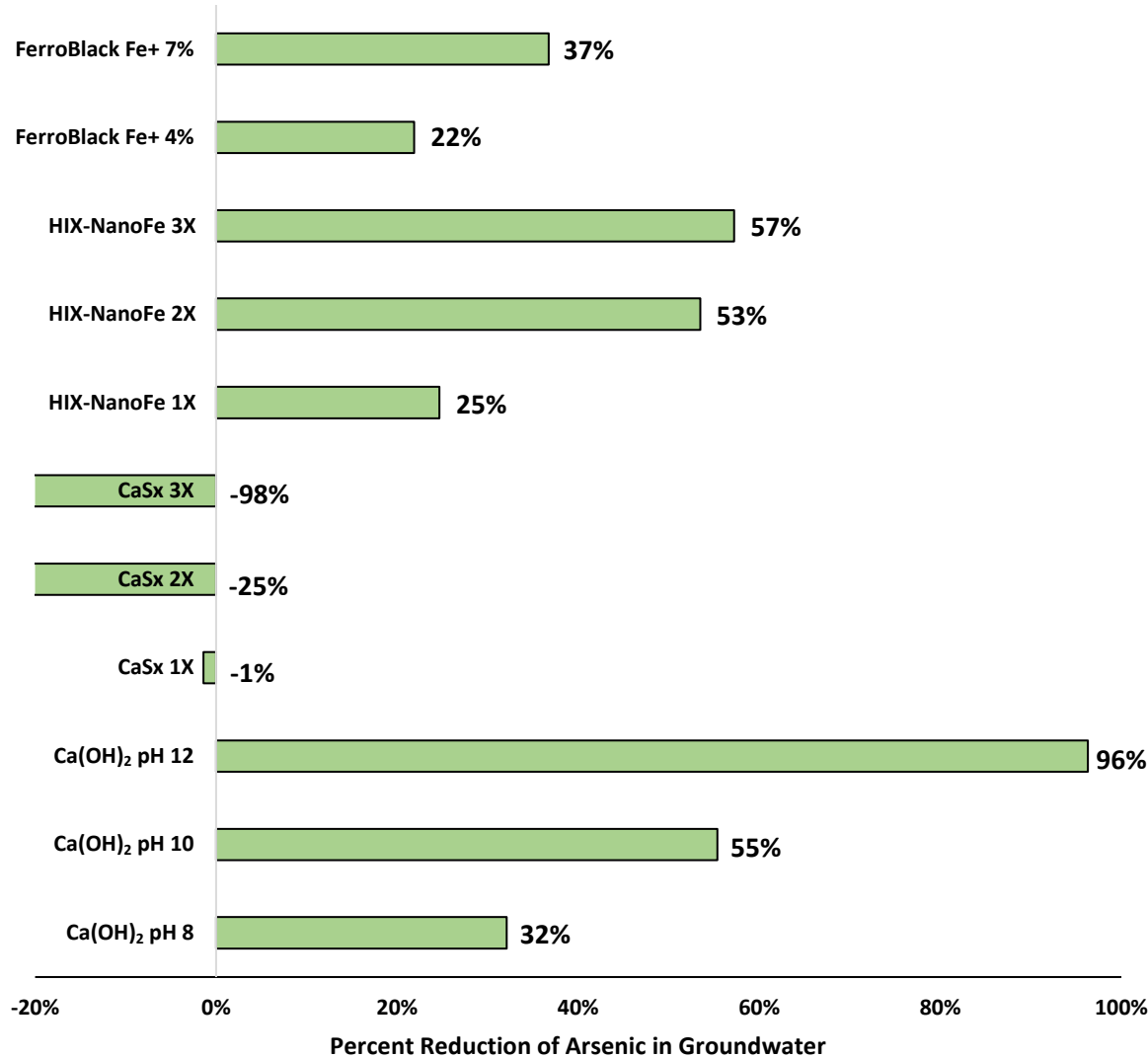


# AOI7-BH-22-001 Soil and MW-56D Groundwater

**Arsenic Reduction During Reagent Screening Test  
15g Soil Sample**

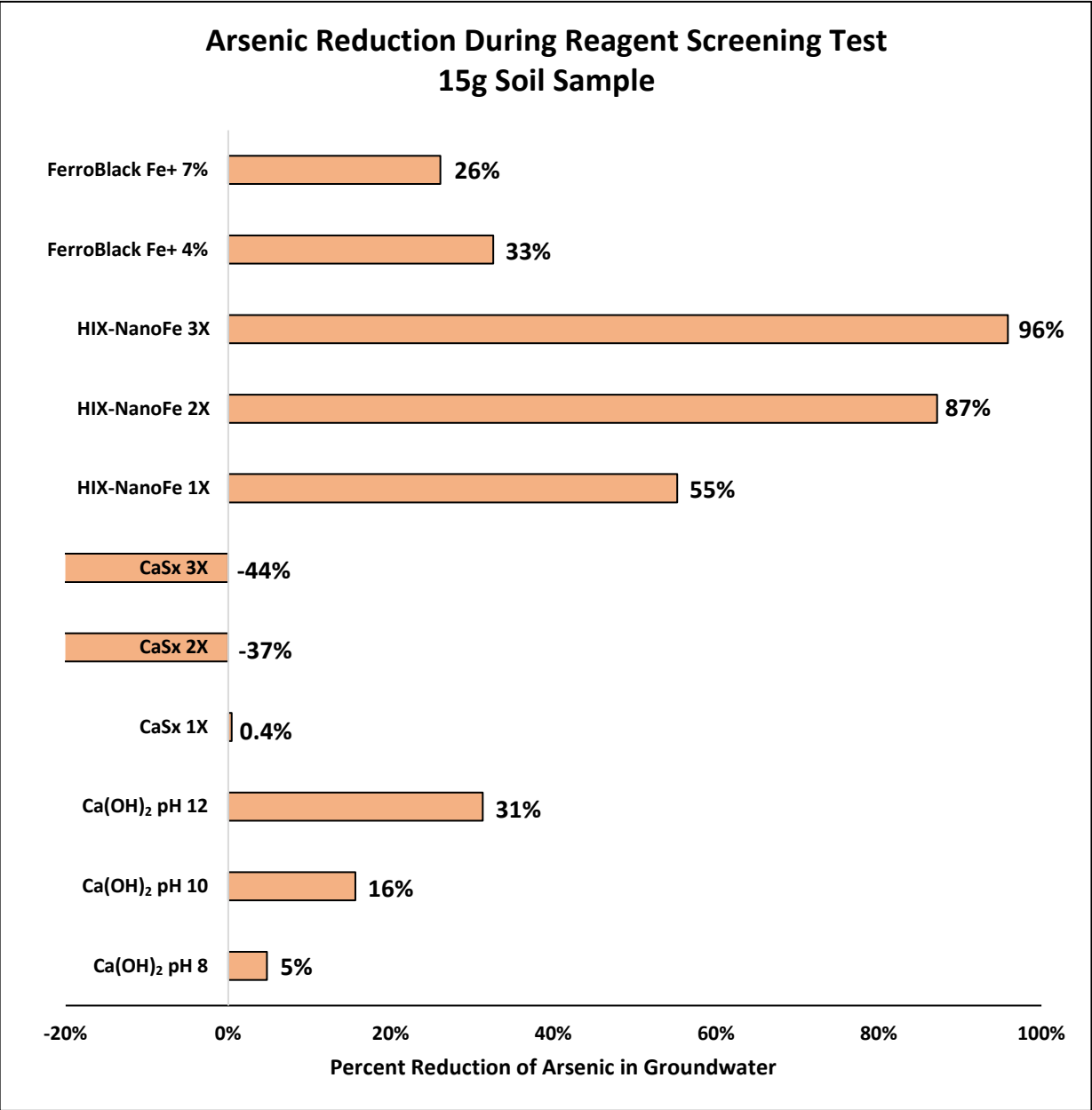


**Arsenic Reduction During Reagent Screening Test  
40g Soil Sample**

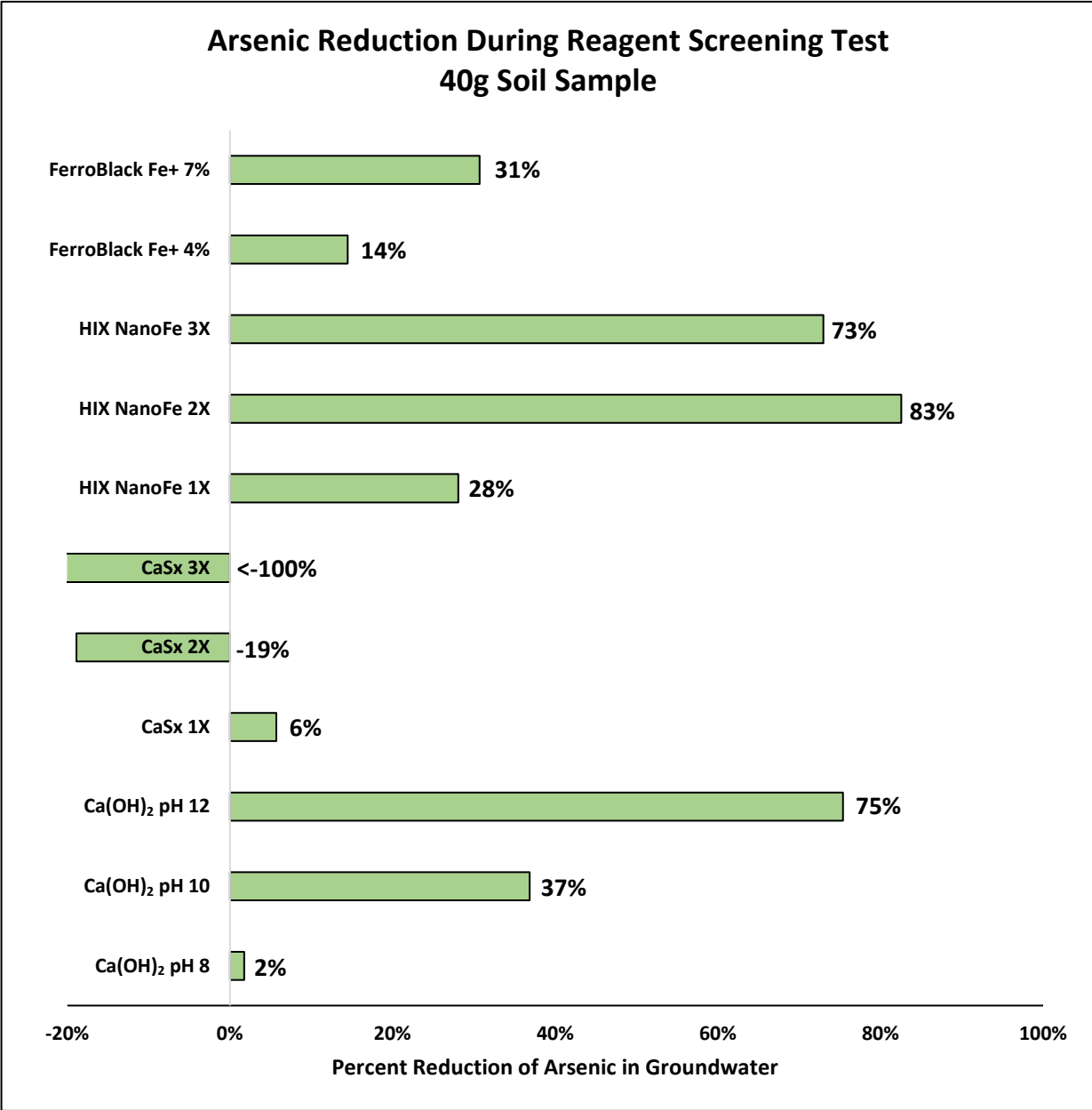


# MW-608D Soil and MW-608D Groundwater

Arsenic Reduction During Reagent Screening Test  
15g Soil Sample



Arsenic Reduction During Reagent Screening Test  
40g Soil Sample



# MW-609D Soil and MW-609D Groundwater

